A CHILTON PUBLICATION

# the Iron Age

THE NATIONAL METALWORKING WEEKLY

April 16, 1953

EAST ENGINEERING LIBRARY

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good equipment keeps production costs

DOWN

*seamless tube mills*
*continuous butt weld pipe mills*
*continuous coating lines*
*flat rolled finishing equipment*
*drawbenches*

ASSOCIATED COMPANIES

[illegible] Machine Company, Ltd., Biddlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

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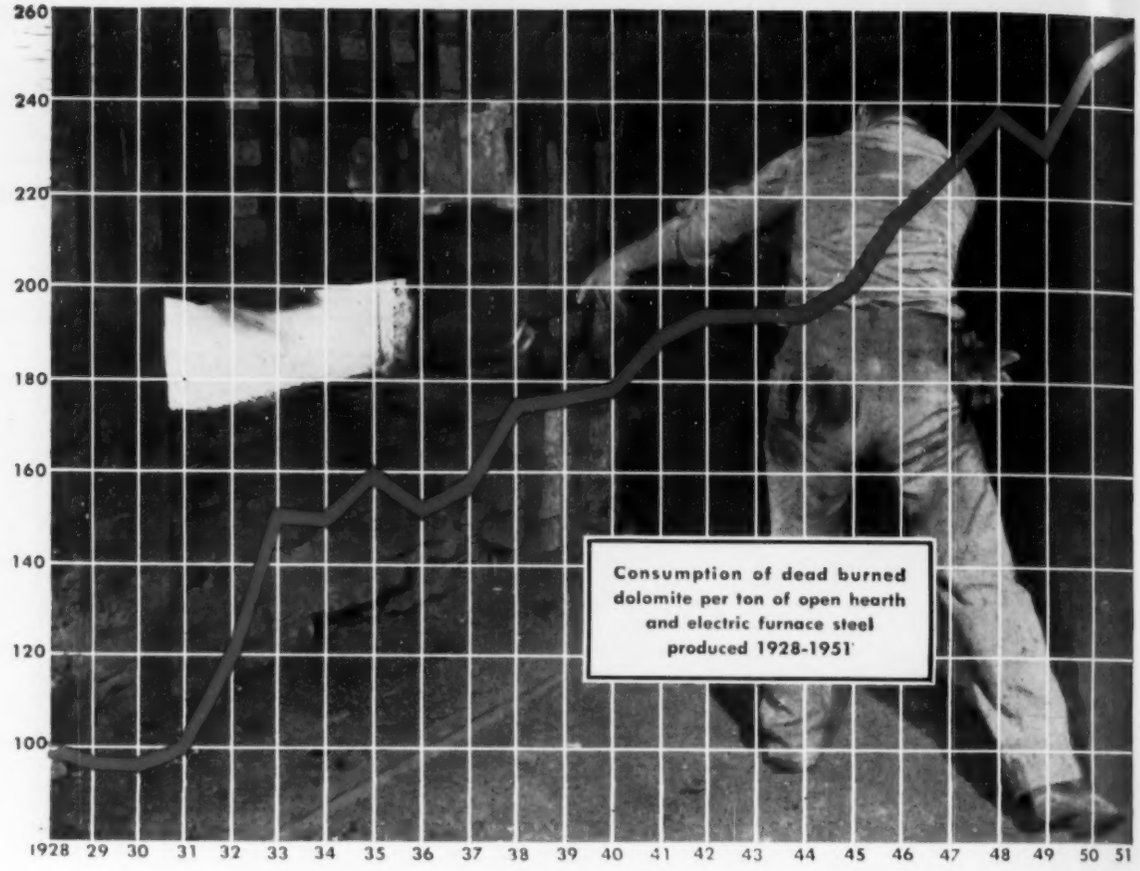
51 YEARS OF CREATIVE ENGINEERING
IN CAPITAL INVESTMENT EQUIPMENT




# raw dolomite vs. dead burned dolomite

RAW dolomite is without peer for routine "drying" of open hearth bottoms and is useful for banking doors and making up banks over the line. However, for bank and bottom maintenance, most operators have concluded that despite its low price raw dolomite is not a low cost refractory.

The difference in price between dead burned dolomite and raw dolomite is essentially a reflection of the difference in the amount of work performed on the two products by the supplier. The increase in refractory value exceeds the increase in price because of characteristics imparted to dead burned dolomite during processing.

To obtain the oxides of calcium and magnesium, the desired refractory constituents, dolomite must be calcined to drive off carbon dioxide amounting to about 50% of its weight. In the case of dead burned dolomite fuel for calcination is provided by the manufacturer, whereas with raw dolomite it is supplied by the steelmaker. The average lime kiln uses about 10,000,000 BTUs to produce a ton of calcined product. Thus in making a 200-ton heat, an open hearth using 100 pounds of raw dolomite per ton of steel, consumes enough fuel in calcination to refine 15 tons of steel!

Merely to get the same number of pounds of refractory oxides contained in a ton of dead burned dolomite requires handling about 2 tons of raw dolomite, with a like reduction in furnace capacity. However, substitution of raw dolomite on a 2 to 1 basis fails to recognize the vastly superior efficiency of dead burned dolomite as a maintenance refractory. The coalescing agent incorporated in dead burned dolomite during manufacture causes the refractory to *set fast and stay fast* at operating temperatures. Concurrently each grain is "shrunk" to about 47% of its original volume and sized to insure a well consolidated repair of maximum density and refractory oxide content.

In contrast raw dolomite calcines to high porosity and low density in the open hearth and in the absence of an integral bond sets erratically under the fluxing effect of slag soaked up from bank and bottom.

These are some of the factors that have dictated the steady 25-year swing to dead burned dolomite. During this period Basic Refractories' capacity for producing its dead burned dolomite products, Magnefer and Syndolag, has been expanded repeatedly to meet steelmakers' needs.

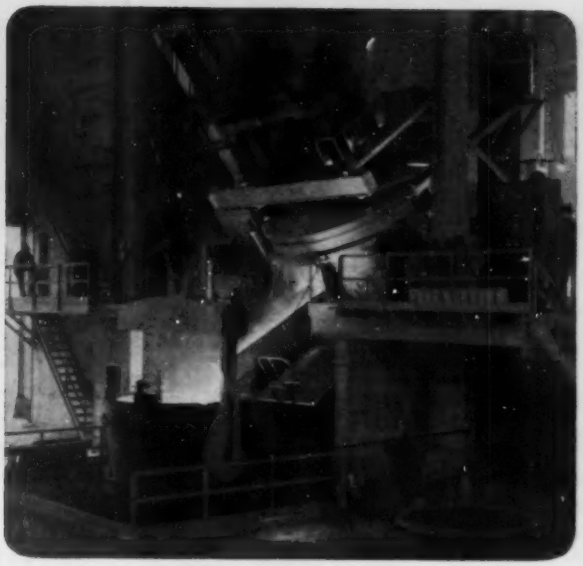
GRANULAR BASIC REFRACTORIES

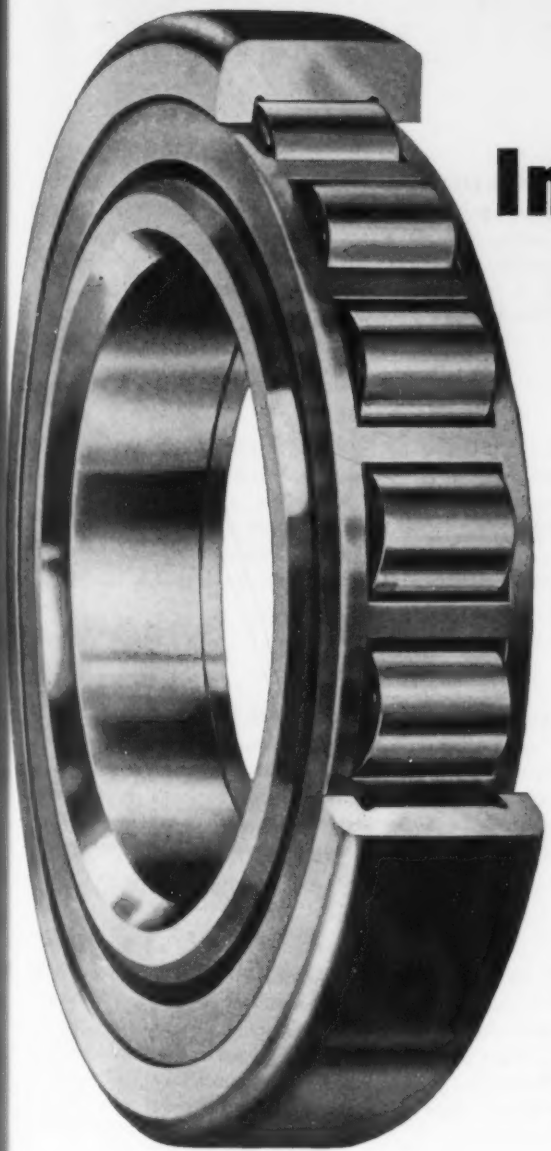
*Basic Refractories Incorporated*

845 HANNA BUILDING, CLEVELAND 15, OHIO

*Exclusive Agents in Canada:* REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

# Electric Furnace Bearing Steel





# Internally Clean... Accurately Rated

Getting rid of non-metallic inclusions is probably the toughest job that confronts any manufacturer of high-grade bearing steels. At Bethlehem we are able to hold inclusions to the minimum by using modern melting methods combined with rigid metallurgical control. And we test every heat at the critical stages of production. As a result of this painstaking care, Bethlehem bearing steels can meet the stringent requirements of the anti-friction bearing industry.

But just as important as our ability to turn out sound steel is our ability to rate or evaluate every heat according to the customers' standards. These standards often vary according to the sizes and bearing components to be manufactured.

Preliminary tests for inclusion ratings are taken by our mill technicians as soon as the billets are rolled. The extent and coverage of this examination is governed by the end use of the finished bearing.

Obviously, any final inspection rating which will be comparative can be realized only where there is a complete understanding between our metallurgists and the customer. Whether you use the 52100 types or low-carbon alloy carburized grades, we will be glad to give you further information on methods of rating, as well as analyses and properties.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM ALLOY STEELS**

BETHLEHEM STEEL

the Iron Age

Vol. 171, No. 16, April 16, 1953

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# DIGEST of th

## NEWS DEVELOPMENTS

**FOUR REASONS FOR KOREAN SHELL SHORTAGE—P. 55**
Looking beyond buck passing on shell shortage question, Iron Age finds four major causes: (1) Military didn't decide fast enough. (2) Output was based on World War II figures or on production estimates. (3) Dependence was put on non-existent plants. (4) There was a lack of production knowledge.

**WORKERS LIKE, BELIEVE, READ HOUSE ORGANS—P. 58**
Employee publications have high readership at all levels, a new survey finds. Workers consider them the No. 1 source of information about their company. And they want to know the facts of the business. Management has a fine chance to tell its story in these publications—and workers believe them.

**LOOK INTO OUT-OF-COURT ARBITRATION — P. 59**
Settle your disputes by arbitration—it's faster and less costly than lawsuits. Decision has effect of a court order. This method can be used to solve almost any controversy. In 1952 more than 2000 disagreements, large and small, were settled through American Arbitration Assn. facilities.

**PICKING TOPNOTCH FOREMEN IS A SCIENCE—P. 61**
Old and sometimes haphazard methods of picking foremen are being supplemented by scientific techniques of personnel management. Industrial psychologists and personnel specialists are playing an important part in the shift. Analysis of job is important. Many firms using personnel profile method.

**USW HOLDS A LOT OF BARGAINING DEUCES — P. 63**
Dave McDonald, steel union president, won't be on a picnic when he bargains with the industry on wages this year. His negotiation position is weak and he may get a modest hike of perhaps as much as 10¢ an hr. Watch the USW's Atlantic City meeting for clues as to what union wage demands will be.

**IKE WILL DECIDE ON MILITARY STRENGTH — P. 77**
President's new policy of getting last word on major Pentagon decisions involving military strength signals an end to the feud between Defense Secretary Wilson and Army and Air Force brass. Consideration of defense needs and balanced budget will determine military decisions.

# the Week in Metalworking

## ENGINEERING & PRODUCTION

**DUAL FREQUENCIES CAN CUT HEATING COSTS—P. 113**
A new concept in induction heating, using dual frequencies, has reduced capital outlay and operating costs. Two sets of continuous coils are used. One man heats 200 billets per hr to forging temperature. Reduce scale loss saves 300 lb of steel per hour. Space requirements are small.

**RESTORED SLABBING MILL HAS HIGH OUTPUT—P. 118**
Modernization of a 36-in. slabbing mill has boosted production to a new high. Now, a smaller crew produces 269 tons per turn. New soaking pits have greater capacity. Improved handling equipment increases the rolling rate and provides smoother operation.

**STUDY HIGH-TEMPERATURE ALLOY PROBLEMS—P. 121**
Defects in high-temperature alloys are more critical than in standard steels. Laboratory tests and production results should be correlated to help ease fabrication problems. A quick test for weldability has been developed. Don't mark these steels with lead or zinc compounds.

**FIRE PROTECTION SYSTEM FOR SCRAP BALER — P. 126**
An expensive hydraulic scrap-metal baler, the heart of a business, gets 24-hr fire protection with an automatic fire-extinguishing system. Pressure-operated switches close doors, stop machinery, sound alarm. Inert gas snuffs out blaze in a few seconds, does not damage equipment.

**HYDRAULIC LATHE SPEEDS ROLL MACHINING—P. 128**
Savings up to 75 pct in roll-machining time have been achieved with a new hydraulic lathe. Hydraulic pressure keeps the cutting tool at constant pressure against the roll. Tool life is materially increased. Lateral movement of tool permits one continuous spiral cut along an even-faced roll.

**NEXT WEEK—HOW TO FABRICATE 430 STAINLESS STEEL**
If you plan to switch from 302 to 430 stainless you may have to revise tooling and fabrication procedures. While simple parts are easily formed, 430 offers some problems in more complicated shapes. Larger blank sizes, higher hold-down pressures, increased radii, added draws and anneals may be needed.

## MARKETS & PRICES

**PRECISION PILES UP WAREHOUSE PROFITS — P. 57**
Eastern Brass & Copper likes customers who are hard to satisfy on tolerances. Firm has supplemented regular warehouse functions with precision processing of copper, brass, aluminum and steel. Growth of precision industries, trend to automation are boosting demand for accurate material.

**BEAT DRUMS FOR SMALL NEW ENGLAND FIRMS—P. 66**
A new trend in financing is making New England a comfortable home for small business. Development firms aim at solving the problem of getting venture capital for small companies. They have a three-way attack. Six-state area boasts 37 such firms. Provide insurance for one-industry communities.

**A PENNY SAVED MEANS MUCH TO AUTOMAKERS—P. 72**
The recent escalation clause wage cut of only 1¢ per hour may mean a saving of up to $400,000 per week to automakers. Auto price tags won't go up because that would be detrimental to sales. But generally high costs are taking their toll. One firm, Chrysler, has cut prices. Others are doubtful.

**TOOLMAKERS MUST CATER TO CIVILIAN NEED — P. 83**
Strong demand for civilian replacement tools anticipated, but builders must sell aggressively. Non-defense market is becoming increasingly important as rated orders now account for only 50 pct of machine tool order backlogs. Industry is warned not to expect too much from the Vance proposal.

**STEEL GETS TIGHTER FOR SOME CONSUMERS—P. 153**
Another big boost in shell program during third quarter will be a tough blow to civilian consumers of large bars. Shell steel needs face a boost of 30 pct or half a million tons. Wildcat rail strikes and production difficulties in Pittsburgh area are tightening supply screws on plates, shapes, beams, and alloys.

**GOVERNMENT DELAYS COPPER STOCKPILING—P. 156**
Activities on all fronts of the copper business hold the spotlight this week. ODM temporarily halted stockpile buying to ease pressure on prices. NPA dropped refined copper allocation to brass and copper wire mills. Fringe prices settling toward 30¢. Rhodesian copper may force Chile price cut.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

# 11 to 1 service record proves B. F. Goodrich belts last longer

## *User reports 3-way saving with grommet V belts*

ORDINARY V belts on these drives lasted only a year. They couldn't take the 24-hour-a-day service, the heavy loads. Covers would separate from the belt, flap around the drive, get caught in pulleys, then tear off completely. Then a B. F. Goodrich distributor recommended grommet V belts. It proved to be a perfect solution. Installed in 1941, both sets of grommet V belts have already lasted 10 times longer, and still look good for years' more service. Here's why BFG grommet belts outlast and outperform ordinary belts:

### *No weak spots*

The section where cords overlap is the weak spot in ordinary belts. That's where 85% of belt failures occur. But in B. F. Goodrich grommet V belts this cause of belt failures has been eliminated. All of the cord material in a grommet belt is *concentrated* in twin grommets. These grommets are cord loops, made like giant twisted cables except that they're endless. There are no splices or overlaps—no weak spots to cause premature belt failures.

### *Better grip, less slip*

Grommet V belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

### *Save 3 ways*

This company, like many others, is making a 3-way saving with grommet V belts. First, they save on replacement costs because grommet belts last longer. They save on production costs with no shutdowns caused by belt failures. And they save on maintenance costs because these belts need less attention. Yet the savings they make are clear profit because grommet belts cost not one cent more than ordinary V belts. Next time you need V belts, order *grommet* V belts from your BFG distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.* (*Available in Canada*).

*Grommet V-Belts* BY
**B.F.Goodrich**
**FIRST IN RUBBER**

THE IRON AGE

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# Nothing To Fear

THERE are those who feel Russian "peace" tactics will plunge us into a serious depression which would violently affect our freedom and security. Others naively believe that the Russians have had a real change of heart—that they now mean what they say. Still others decry the wild rumors, random thoughts and fancy writing about where we are headed.

These viewpoints are part of our national thinking. They have a bearing on what happens to us in the future. But some of this popular thinking overlooks certain basic responsibilities.

Congress, the Administration and business have had thrust upon them the most serious load of responsibilities ever placed upon representatives of a free people. The man on the street wants leadership. He expects it in our hour of crisis. He wants to know—is the leadership there? We believe it is there.

There is a hard core of senators and representatives who know what the Russians are trying to do. These men place the welfare of their country above all political and personal considerations. As long as these men are in Congress this country will never be caught unprepared to meet a serious threat to its security. These representatives of the people know what is being done, what should not be done and what is needed to keep us strong. So-called peace offensives leaves them cold.

In a little less than 90 days the Administration has made progress in revising our basic policy of freedom for the individual and freedom for private enterprise. That policy had become progressively weaker during the preceding 20 years. This Administration is well aware of Russian goals. It will allow nothing to be done which will weaken us in the face of the communistic threat to our liberties.

Businessmen, too, have their grave responsibilities. They must put patriotism and defense jobs above all else. If they fail in this they will lose the best chance they ever had to be fairly understood. A man-made depression, aided and abetted by gossip and lack of hope and leadership, is unthinkable.

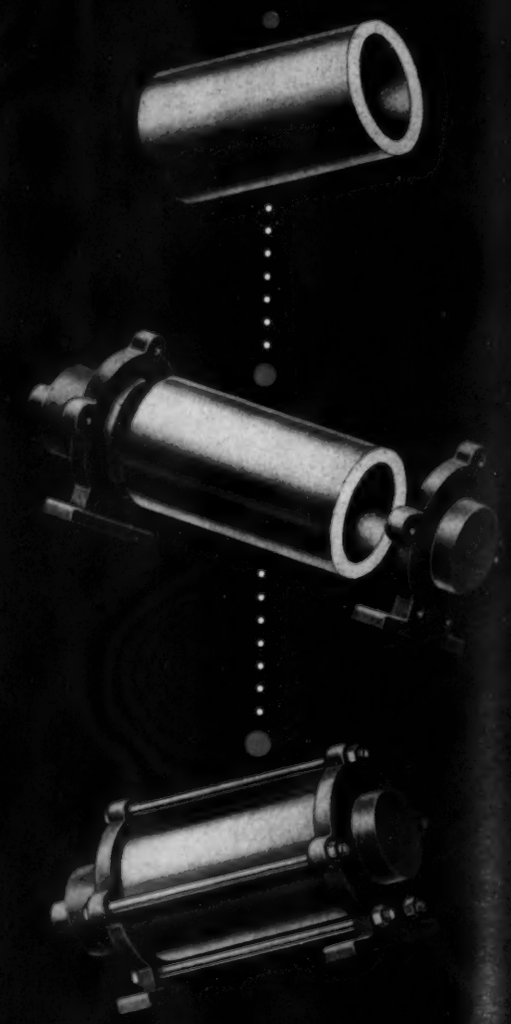
There is nothing to fear if Congress, the Administration and business furnish the leadership and action demanded by people who would rather be dead than be slaves.

Tom Campbell

Editor

# new cylinder tubing

*eliminates boring and honing*



You can realize startling cost savings when you use Rockrite® cylinder finish steel tubing for hydraulic cylinders, shock absorbers and similar parts. ● The inside is smooth, scratch-free—a surface just right for a piston with soft packing. Smooth bore surface plus exceptionally close dimensional tolerances means that this tubing can be cut-to-length and used as is. It is easy to make standard parts that are interchangeable. Slash your costs by using Rockrite cylinder finish tubing. ● Ask for Bulletin R-7 giving more data.

ROCKRITE TUBING

**TUBE REDUCING CORPORATION**

WALLINGTON, NEW JERSEY

# Dear Editor:

*Letters from readers*

### Glimpse of Hell

Sir:

Upon reading the Mar. 26 issue we were quite impressed with your editorial entitled "A Glimpse of Hell." It struck us as a very much down-to-earth and very personal statement of your experience during the recent atomic bomb blast.

We should like, with your permission, to reproduce this editorial in an early issue of our employee publication, with appropriate credit line. Before we do so, however, we would appreciate your release and permission for reproducing.

*W. H. SCHAFER*
*Advertising Manager*
*Cold Metal Products Co.*
*Youngstown*

### Mighty Mite

Sir:

We read with interest your News-front page of the Mar. 26 issue.

Notice the paragraph devoted to the 1500-lb vehicle called the Mighty Mite as developed for the Marine Corps. We wonder if it would be possible to learn of the manufacturer of this new vehicle.

Would like to take this opportunity to congratulate you for your very informative weekly publication which we read with great interest.

*R. A. RAMSAY*
*District Engineer*
*Torrington Co.*
*Torrington, Conn.*

**More details appeared on p. 113 of the Apr. 2 issue.—Ed.**

### New Hydraulic Lathe

Sir:

Referring to the item on p. 86 of the Apr. 2 issue stating that savings up to 75 pct in roll machining time has been gained at one plant with a new hydraulic lathe, can you tell us who makes this new hydraulic lathe?

*W. W. McKAIG*
*Cumberland Steel Co.*
*Cumberland, Md.*

**The manufacturer is the Lewis Machinery Div., Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.—Ed.**

### Clarification

Sir:

Our attention has been called to the table "Motor Vehicle Production By Companies" on p. 440 of your 98th Annual Review and Metal Facts Issue.

The tabulation detailing 1952 car and truck production departs from prior annual issues when either 10 months' production figures or such clarification as "IRON AGE Estimates Based on 10 Months' Production" were used along with the Ward's Automotive Reports credit line.

We feel certain the elimination of suitable footnotes in your 98th Annual was an oversight, and it is in the interest of accuracy to which your publication is dedicated that we bring the matter to your attention at this time.

*H. A. STARK*
*Managing Editor*
*Ward's Reports, Inc.*
*Detroit*

**Sorry, it was an oversight.—Ed.**

### Can You Help?

Sir:

In checking the Union List of Serials and several large steel firms we have come upon the startling fact that only one library owns the early issues of THE IRON AGE, and that collection is incomplete.

Can you tell us where a complete set of THE IRON AGE is available?

*J. P. WESNER*
*Librarian*
*Bethlehem Steel Co.*
*Bethlehem, Pa.*

**Our own early editions met with an accident. Some copies during the period 1856 to 1865 can be found in the New York Public Library; from there on the Library of Congress has a complete set. The editors would appreciate knowing of any other 1855-1865 copies.—Ed.**

### Grouping Mechanism

Sir:

We refer to the fifth item on p. 69 of your Mar. 26 issue dealing with electro-spray paint systems.

Can you offer us more information on the use of a grouping mechanism as described in this item?

*A. L. ROSENKRANZ*
*Purchasing*
*Keystone Electric Mfg. Co.*
*Philadelphia*

**Further information may be obtained from the Ransburg Electro-Coating Corp., 1232 Barth Ave., Indianapolis, Ind.—Ed.**

### Titanium Producers

Sir:

If possible we would like to obtain from you a list of companies engaged in the manufacture of titanium.

*J. R. POYSER*
*Vice-President*
*Doelger & Kirsten, Inc.*
*Milwaukee*

**The following are manufacturers who sell titanium products commercially (we are not including sellers of sponge only): Titanium Metals Corp., New York; Rem-Cru Titanium Co., Inc., Midland, Pa.; Republic Steel Co., Masillon, Ohio; and Sharon-Mallory Titanium Co., Niles, Ohio.—Ed.**

**Bowser Cold Treatment**

***. . . Makes good products better***

One of the most dramatic recent developments in the making of better metal products has been the use of cold treatment.

To help you take full, economical advantage of this new process, Bowser Technical Refrigeration now has available a line of standard units. These new units, with ranges from −50°F to −200°F (or lower), have countless applications in the production of superior metal products.

**Bowser cold treatment can help you:**

- ***Increase cutting tool life as much as 500%.***
- ***Eliminate distortion and cracking resulting from grinding.***
- ***Permanently stabilize dimensions of precision parts, gages and tools.***
- ***Improve expansion fitting, salvage out-of-size dies.***
- ***Increase hardness and lengthen life of carburized alloy gear steels, blanking and forming dies, etc.***

Bowser will be glad to cold treat your sample parts, tools or products — without cost or obligation.

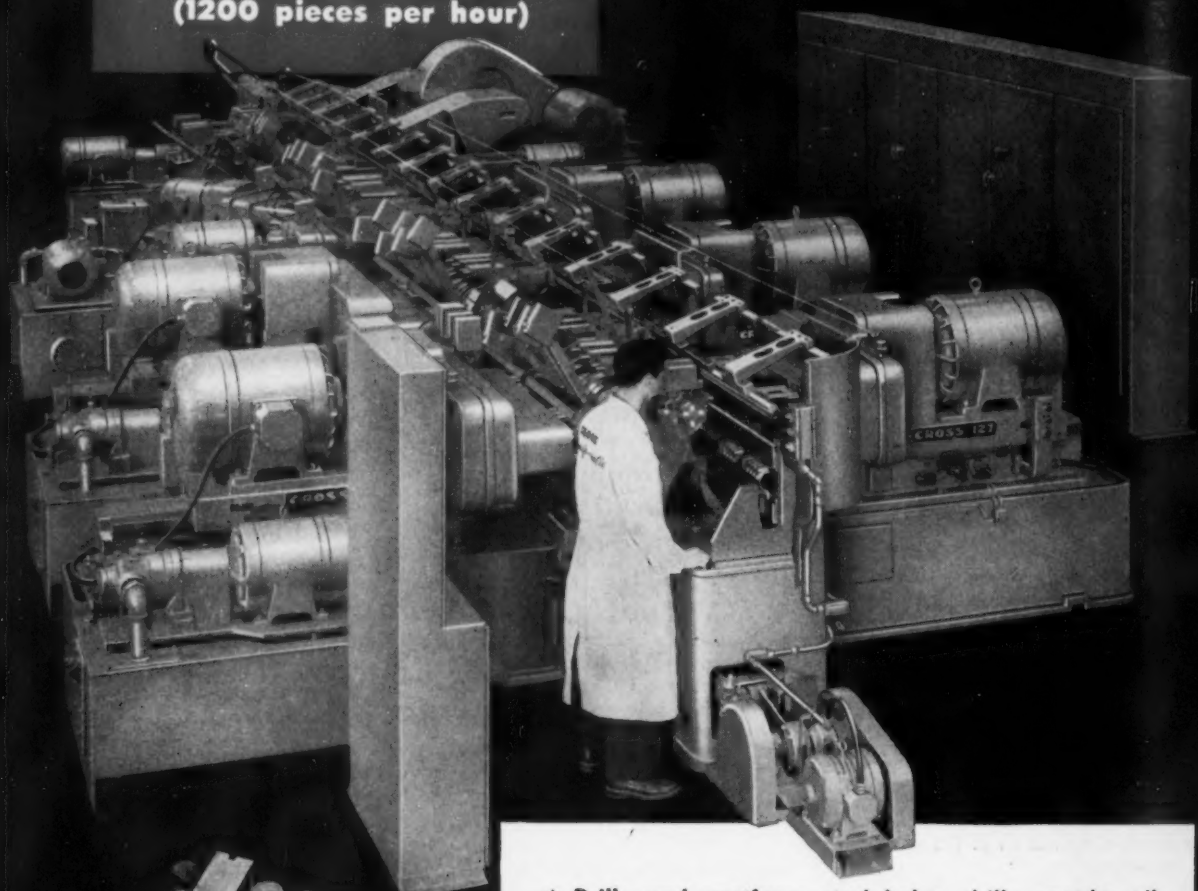
Write For Details

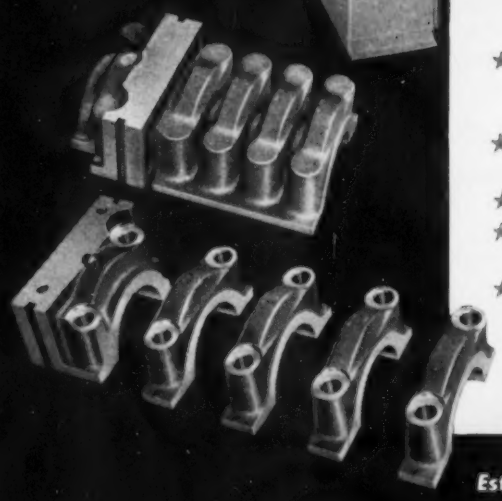
BTR *BOWSER TECHNICAL REFRIGERATION*

# Mills, Drills, Spotfaces and Taps Bearing Blocks

(1200 pieces per hour)

*Another Transfer-matic by Cross*





★ Drills and spotfaces stud holes; drills angular oil hole; drills and taps two screw holes; mills bearing lock slots; and saws into five individual pieces.

★ 240 bearing block sets (1200 pieces) per hour at 100% efficiency.

★ Capacity for machining two sets of parts at a time.

★ Two heavy-duty, 25 hp, vee belt drive, milling spindles for sawing operations.

★ Other features: Built-in chip conveyor, automatic lubrication, overhead transfer mechanism, gravity operated cam clamping for work holding fixtures, J.I.C. hydraulic and electrical construction.

*Established 1898*

THE CROSS CO.

DETROIT 7, MICHIGAN

*Special* MACHINE TOOLS

# Fatigue Cracks

*by William M. Coffey*

## MISCELLANEA

The fact that President Eisenhower has passed up the chance to throw out the first baseball in favor of golf won't have too much effect on the mature, reasonable voter we hope (must be several hundred of them around) — but don't let the kids hear about it. Which brings to the fore a small jest:

**"That's good for one l o n g drive and a putt," said the confident golfer sizing up a three-par hole. He took his driver and slashed viciously at the ball and topped it. It rolled a few feet in front of the tee.**

**His diplomatic caddy came up and h a n d e d him his putter. "Now" he said, "for one hell of a long putt."**

This was first told by St. Andrew himself who, they say, founded the game in 1754. Through the years, from tee to tee, it has grown in strength and popularity until it finally reached Fatigue Cracks. Truly, good things never grow old.

* * *

. . . and we have still another letter, received the other day, which for freshness of form reaches new heights in the annals of business letter writing:

Very truly yours,
E. W. BLISS COMPANY
J. T. Harrington
Advertising Manager

We are writing this letter upside-down because we feel that people are interested first in who it is from. They already know that it is to them or they wouldn't have gotten it.

Thought you would like to correct the address in your file for the Bliss Company. The invoice attached to your subscription renewal letter is being processed and you should receive a renewal order in a day or so.

Enjoying the hell out of Fatigue Cracks. Hope your boss lets you go to Florida soon.

Mr. W. M. Coffey,
Manager, Circulation,
The Iron Age,
100 East 42nd Street,
New York 17, N. Y.

Of course, you can easily see the real reason we printed this letter.

* * *

Another new joke which we printed here some time back (the one about the two snakes in Noah's Ark who couldn't go forth and multiply because they were adders) has brought forth a torrent of two letters with an engineering flavor. Mr. D. J. Foskett wrote from London that "the story was inaccurate because the snakes were found in the middle of the forest which was then cut down so that, although adders, they could multiply by logs." And Mr. W. E. Brainard of Hughes Aircraft, California, wrote that "Noah should have chopped down a tree and built a table from its logs. Adders can easily multiply if they have a log table." One more case of great minds and hands across the sea.

* * *

## Puzzlers

We've been receiving some other strange letters recently. Last week, if you'll remember, we printed one from a Professor O'Cobhthaidh of Grinnell University, R. I. On checking, however, we found no such institution (there's a Grinnell U. in Iowa, but not in R. I.). We immediately wrote the Professor "how come?" He sent this back:

**Lat. 41° 30′ 00″ N**
**Long. 71° 22′ 20″ W**

**Sir:**

**By a unanimous vote of the President, the Board of Trustees, the Faculty and the student body the name of this University has been changed to O'Cobhthaidh University. *He* has done this because the name "Grinnell" was pre-empted by a college in Iowa in the year 1848 which antedates this university.**

You must be one of them ivy schools, professor. And, incidentally, you solved correctly the old ladder puzzle and made a great stab at the water into steam puzzle.

The answers to the two-part tin can puzzler are: 6.65 in. diameter x 6.65 in. high and 8.38 in. diameter x 4.19 in. high. The winners: Mr. Rice, R. H. Games, C. S. Kinnison, Helen F. Swindler (close enough). John Demmler, Charles Gathey, Chuck Williams, Robert Wheeler, Bill Farley, 3rd (who dropped in to see us last week), and J. L. Vaupel, W. P. Kratz, Bill Lampin, S. Yolton, P. P. Beers (who also took a stab at the water into steam problem) A r t h u r Beal, John Beardsley, D. A. Shearer, E. L. Prochet and Carl Leeds. Try again Mary Lou Perrot.

*New Puzzle:* The side of a wine glass makes a 60° included angle. The wine is one inch (1 in.) deep in the glass. What is the diameter of a ball bearing which dropped into the glass will just be immersed in wine? Many thanks, Mr. Allen, but you forgot to send the answer.


when quality counts and accuracy is important

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Standard Stamping

for all perforated metals, plastics, masonites, papers

STANDARD will perforate your material—or from our stock on hand to your specifications.

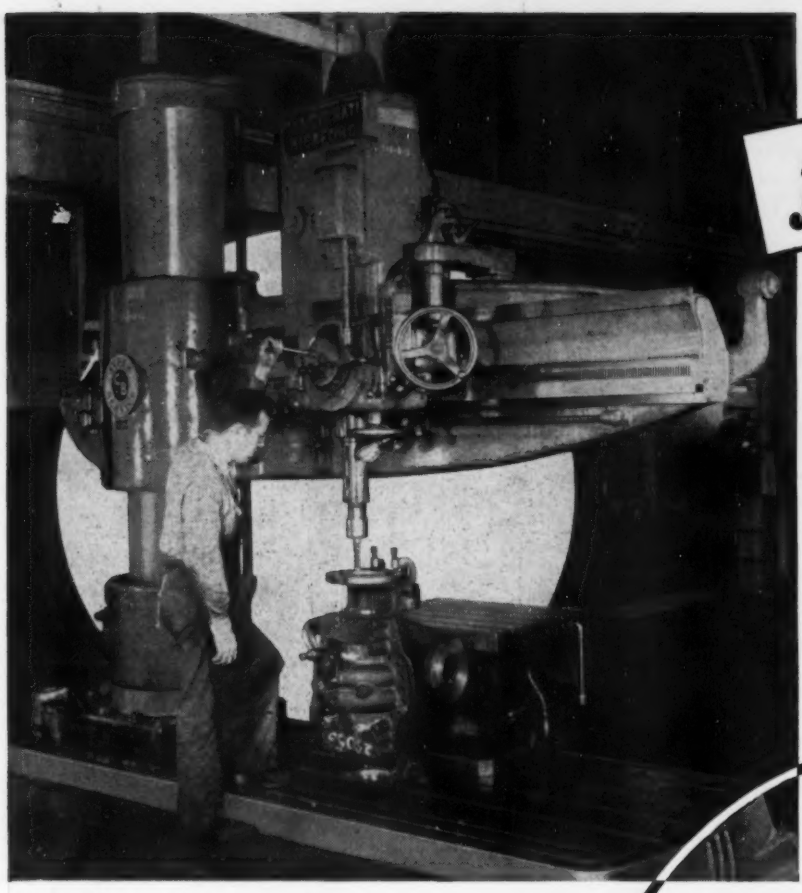
STANDARD has complete fabricating facilities: bending, drawing, punching, welding.

STANDARD has a complete selection of dies and a staff to create custom dies in record time at the best price!

Standard STAMPING & PERFORATING COMPANY
3131 West 49th Place, Chicago 32, Ill.

Write now for more information and for a copy of our new folder "There Are Holes in Our Story."

Name _____
Company _____
Address _____
City _____ Zone _____ State _____



*Photo—Courtesy Pacific Pump, Inc.*

# *faster and easier... machine performance*

Pacific Pump, Inc., say maximum production is the result of the faster, easier controls and fine balance of our 7′ arm, 19″ column Cincinnati Bickford Super Service Radial Drill. Here centrifugal pumps for process industries, utilities, and marine power plants, are being drilled, tapped, and spotfaced with speed and economy. Cincinnati Bickford Super Service Radial Drills will bring you too, maximum productivity at low cost.

Write for Booklet R-29.

**Half shells for a centrifugal pump—approximately 100 holes are drilled—half of which are also tapped.**

**CINCINNATI BICKFORD**

SUPER SERVICE

**RADIAL AND UPRIGHT DRILLING MACHINES**

**THE CINCINNATI BICKFORD TOOL CO.**

**Cincinnati 9, Ohio, U.S.A.**

# Dates to Remember

### *Meetings*

**April**

NATIONAL SCREW MACHINE PRODUCTS ASSN.—Annual meeting, Apr. 18-23, St. Moritz Hotel, New York. Association headquarters are at 2860 E. 130th St., Cleveland.

METAL POWDER ASSN.—Annual meeting and Metal Powder Show, Apr. 21-22, Hotel Cleveland, Cleveland. Association headquarters are at 420 Lexington Ave., New York.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION—Annual engineering conference, Apr. 22-23, Detroit. Institute headquarters are at 101 Park Ave.,

EXPOSITIONS

MATERIALS HANDLING SHOW — May 18-22, Philadelphia.

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

NATIONAL TOOL & DIE MANUFACTURERS ASSN.—Spring meeting, Apr. 23-25, Statler Hotel, Washington. Association headquarters are at 907 Public Square Bldg., Cleveland.

WOVEN WIRE PRODUCTS ASSN. — Semiannual convention, Apr. 26-28, Grove Park Inn. Association headquarters are at 1721 W. School St., Chicago.

AMERICAN ZINC INSTITUTE—Annual meeting, Apr. 27-28, Hotel Statler, St. Louis. Institute headquarters are at 60 E. 42nd St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Spring meeting, Apr. 28-30, Deshler-Wallick Hotel, Columbus, Ohio. Society headquarters are at 29 W. 39th St., New York.

CONCRETE REINFORCING STEEL INSTITUTE — Annual meeting, Apr. 27-May 2, The Carolina Hotel, Pinehurst, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

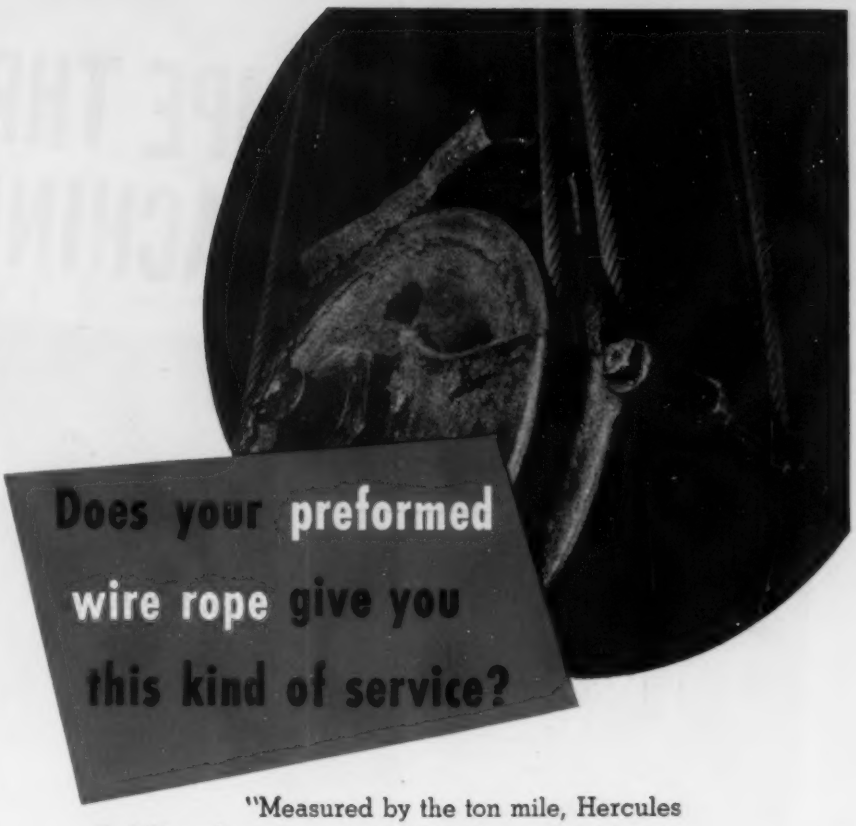
WIRE REINFORCEMENT INSTITUTE, INC.—Annual meeting, Apr. 27-May 3, Carolina Hotel, Pinehurst, N. C. Institute headquarters are at National Press Bldg., Washington.

**May**

NON-FERROUS FOUNDERS' SOCIETY, INC.—Annual meeting, May 4, Chicago. Society headquarters are at 192 N. Clark St., Chicago.

COMPRESSED AIR & GAS INSTITUTE —Spring meeting, May 4-6, King & Prince Hotel, St. Simons Island, Ga. Institute headquarters are at 122 E. 42nd St., New York.

CENTRAL FABRICATORS ASSN.—Annual meeting, May 4-5, Skirvin Hotel, Oklahoma. Association headquarters are at 53 W. Jackson Blvd. Chicago.

**Does your preformed wire rope give you this kind of service?**

"Measured by the ton mile, Hercules Red-Strand preformed outlasts others about two to one," reports one operations manager. Another operator testifies, "Our records show Red-Strand is considerably out in front of four other ropes."

**Why HERCULES Red-Strand excels**

What's the reason for such performance and praise? In simple terms, it's because *higher-than-rated quality* in Red-Strand preformed delivers *longer-than-expected service.*

If you're not completely satisfied with *your* wire rope service, try Red-Strand preformed. You'll experience the difference too.

HERCULES® Red-Strand wire rope made by A. Leschen & Sons Rope Company, St. Louis 12, Missouri

*In business only to make wire rope ... better wire rope ... since 1857*

HIGHER-THAN-RATED QUALITY

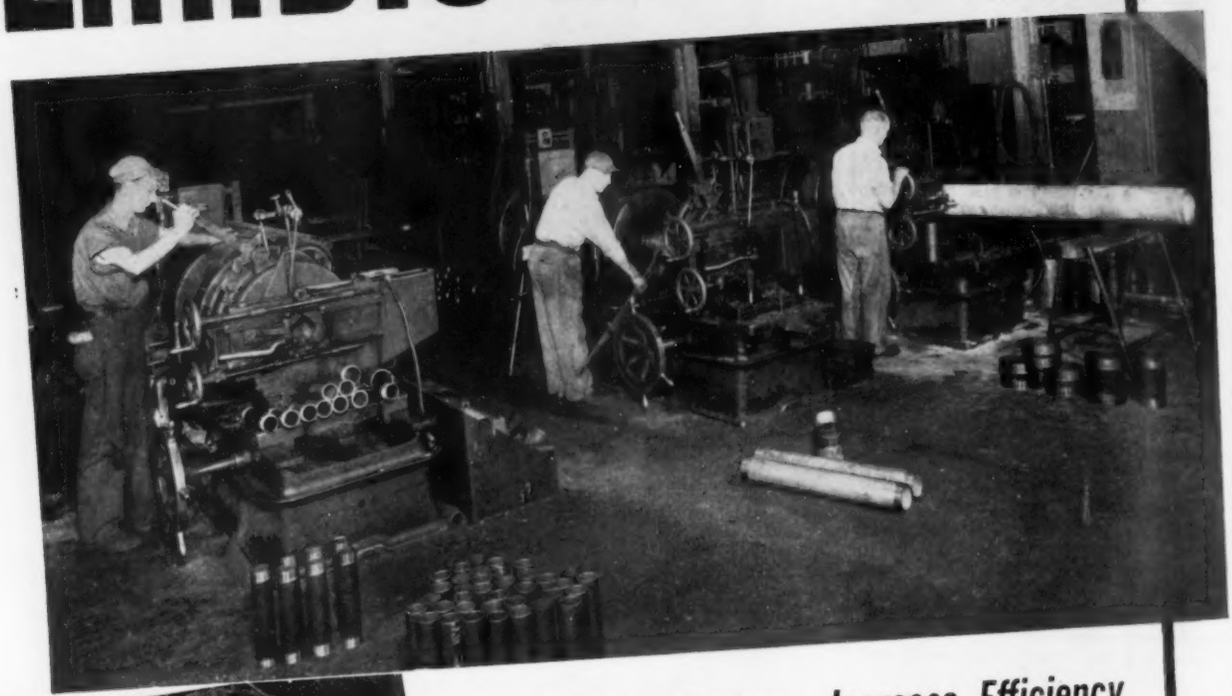
LESCHEN

WIRE ROPE AND SLINGS

A. LESCHEN & SONS ROPE COMPANY

DISTRIBUTORS IN ALL PRINCIPAL CITIES

# LANDIS PIPE THREADING MACHINES



## . . . 4 Major Features Increase Efficiency

**1. WIDE RANGE**—Just three LANDIS Pipe Machines (2", 8" and 18") will thread all diameters of pipe from ½" to 18". Each machine is constructed so as to handle a wide range of pipe sizes—for example, the 6" machine will thread all diameters from 1" to 6". Universal size adjustment allows quick set-up.

**2. DIE HEAD EFFICIENCY**—The design of Stationary heads provides maximum rigidity on all diameters within their range. Positive locking action is assured through a self-locking toggle joint. Size adjustment is quickly and easily obtained through the use of a single locking nut.

**3. LOW TOOL COST**—Chasers operate at a tangent to the work. Line contact at cutting edge reduces friction. Permanent throat assures even chip distribution. Variable rake affords proper cutting edge for different materials. Landis chasers are useable for 80% of their original length. They are individually replaceable and, within the range of a given die head, a single set can be used for all diameters of the same pitch, form and taper.

**4. PRECISION TAPERED THREADS**—The Receding Chaser Pipe Machines are especially designed to cut tapered threads to meet A.P.I. requirements. Chasers recede into the die head at a rate equal to the taper of the thread, ensuring accurate and uniform taper along the full thread length.

50TH ANNIVERSARY

**LANDIS *Machine* CO.** WAYNESBORO PENNSYLVANIA

the Iron Age
FOUNDED 1855



# THE IRON AGE Newsfront

WHEN THE SMOKE OF THE AMMUNITION SHORTAGE CLEARS AWAY it will have been proved that the steel strike had nothing to do with the shortage. Real causes: (1) Lack of organization in Ordnance Districts. (2) Poor planning in the Pentagon. (3) Rates of fire were found to be several times more than War II rates. But proper authorities learned this fact too late.

SUPPLEMENTING THESE BASIC REASONS FOR SHELL SHORTAGES, equipment failures were an important factor in lowering shell output of the few plants that really got into production. Government reserve machine tools lent to manufacturers for shell production were uniformly in terrible shape.

WEAR RESISTANCE OF DUCTILE IRON PISTON RINGS has ranged from 30 pct over to 30 pct under that of standard steel rings, a European manufacturer reports. Despite this, the producer is going ahead with studies of materials, methods and testing procedures in the firm belief that nodular iron will make the piston ring of the future.

REFUELING OF JET PLANES has been eased with a new, light fuel-line coupling. The device, weighing 80 pct less than the standard fitting, is reported to give greater safety against fuel leakage even at three times normal pressures used.

AUTO PRODUCERS HAVE TAKEN IN STRIDE government restrictions limiting nickel stainless steel to purely functional uses. By substituting chrome stainless they have actually been able to raise average stainless use from 24 lb per car to 28 lb per car.

OIL INSTEAD OF RESIN is being tested as a binder for shell molding sands. Pilot plant operations indicate the method may prove commercially sound. If oil can be used, shell molding costs could be cut.

BEST NEWS ON ALLOYING MATERIALS is that chromium supply still looks good and tungsten controls have been raised. Columbium is still tight and substitutions for cobalt are moving very slowly.

OF MAJOR IMPORTANCE TO THE SMALL CAR is the design of the Chevrolet V-8 engine which will appear in 1955. It will be completely new, not just a small version of other General Motors V-8 engines. Reports are the engine will develop more than 130 hp.

GOOD USE OF MARKET STUDIES is being made by auto companies not only for their own product, but to sound out the competition's market position. Recent selling troubles encountered by a major producer were accurately forecast by a competitor.

NEW SUPPLIES OF BERYL ORE from Brazil are being firmed up to assure an adequate supply of raw materials for beryllium metal production.

WATCH FOR HEAVY PLAY BY LIGHT METALS industry at the Materials Handling Show. Everything from magnesium tote boxes to a magnesium-wheeled yard ramp for unloading freight cars will be shown. The 2000-lb ramp carries a 16,000-lb axle load and can be moved by one man.

Case History IA-105

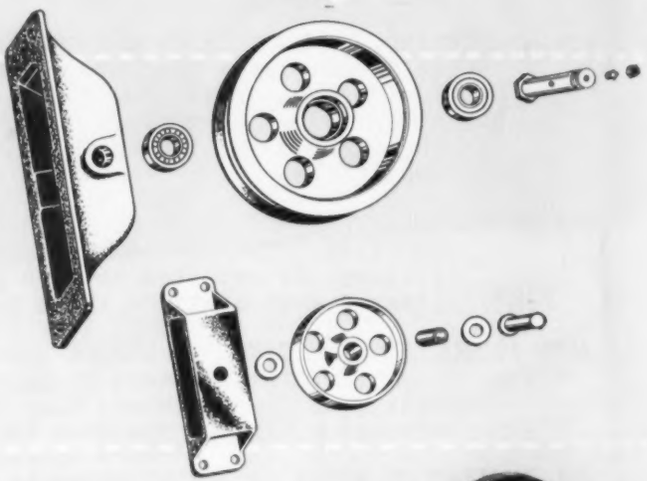
# Here's what we mean by SUPERIOR ENGINEERED FOUNDRY PRODUCTS...

## PROBLEM:

A manufacturer needed a source of supply capable of designing, machining and assembling complete mechanical units ready for field installation; in this instance, hangar-door hardware.

## SOLUTION:

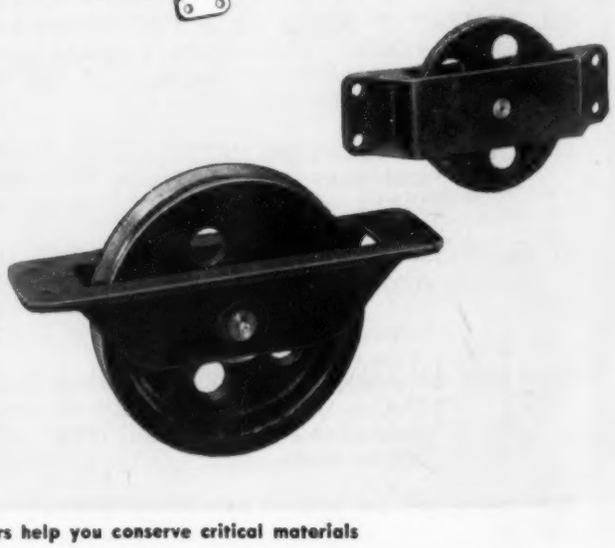
SUPERIOR FOUNDRY ENGINEERED DESIGN castings in malleable iron . . . machined, assembled, packaged and shipped complete, ready for installation in the field.



## RESULT:

No costly designing, machining and assembly problems for the manufacturer ...plus a packaged assembly easy to install in the field for satisfactory service.

**You, too, can get advantages like these! Consult our PRODUCT DEVELOPMENT SECTION regarding your problem . . . while it's still in the planning stage.**



Let our foundry engineers help you conserve critical materials

Since 1916

**SUPERIOR STEEL AND MALLEABLE CASTINGS CO.**

**BENTON HARBOR, MICHIGAN, U. S. A.**

# SHELLS: Real Reasons Behind Shortage

**Military men did not know how many shells they would need . . . Production estimates thrown off . . . We relied on non-existent facilities and lacked know-how—By *K. W. Bennett.***

Why did Army shell stockpiles grow dangerously low in Korea? In Washington the verbal crossfire of top military planners passing the buck of responsibility hardly provided a clear-cut answer. Yet on investigation by IRON AGE the "why" of the shortage boiled down to four major reasons.

(1) First of all, the military did not decide on how many shells it would need until at least 2 months after the Korean war began. Money to equip plants to build shells was slow in coming.

(2) Manufacturers designated to make shells based output estimates either on World War II figures or on what could be made with efficient plant facilities. Both methods of reckoning production in many cases proved wrong.

(3) Dependence had been put on shell plants and facilities that no longer existed.

(4) There was a serious lack of knowledge of forging and machining operations in shell making.

### Delay Decision On Need

Although the Armed Services knew shell consumption per gun firing this time would top World War II, they produced no definite decision on need until September 1950—2 months after war had started. Then they said firepower would demand at least 2.5 more shells per gun than in World War II.

One shell manufacturer was told by Ordnance to produce all the shells he could—with no limit. Other plants after giving an estimate and failing to reach that proposed schedule, were told to keep producing all they could.

When it was found impossible to meet scheduled production rates or meet output dates in late 1951, Ordnance let what amounted to open-end contracts. Shell hungry guns of Korea snarled up advance military planning. For instance, one battalion of 105's in 15 days of fighting used 1,087,000 rounds—or about 1 week's production in 1952.

In the first 6 months after Korea we made 1 million rounds. There was perhaps an overly heavy reliance on what seemed to be huge stocks of shells left over from World War II. In 1952 we made 52 million shells, mostly in the later half of the year. World War II reserves had not been increased during 1946 to 1950 for economy reasons. Until January 1951 no major grants of ammunition money had been made.

Even with good availability of new machine tools and easy delivery of other equipment, new plants would have needed at least 1 year to reach full production after the contract was let. But optimum conditions did not prevail. Shortages and other factors extended considerably the time new plants needed to produce on a big volume basis.

Many shell manufacturers were led into making too optimistic production estimates. When asked by the military in early '51 as to how many shells they could make, companies had to reassemble their old shell-making staffs.

Ordnance was willing to cooperate—but it overestimated the value of its reserve of 13,000 or so machine tools. Installed as rapidly as possible, many of the stockpiled tools just as promptly began to break down.

Early in 1951 one manufacturer figured he could reach output of 32,000 shells per month by April 1952. How wrong he was—for in May '52 his output was 3600 per month. Another firm with a schedule of 35,000 per month was stuck at 5000 per month long after its deadline.

Another managed to hit 15,000

SHELLS ready to go through heat, quench, and draw sequence.

in the month the schedule called for 30,000. This plant rose to 10,000 the following month but then the schedule called for 40,000. Still more machine tool breakdowns had hit it. With passage of another month, the firm made 20,000—but by then the scheduled rate was 50,000.

A fourth producer was originally scheduled at 80,000 a month but has been unable to exceed 62,000.

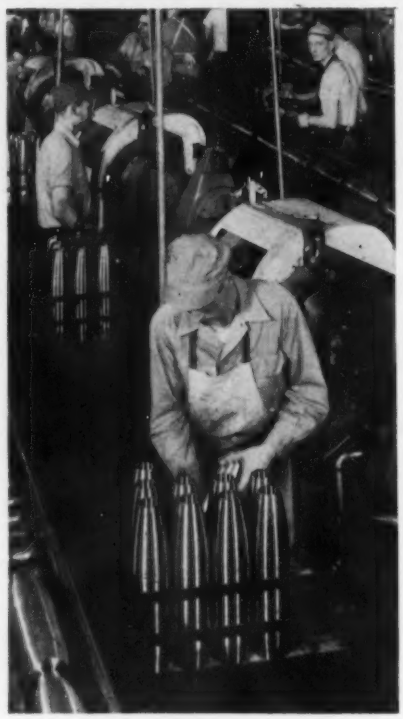
Why were schedules made in good faith broken so drastically? An important reason was the tired condition of tools arriving from U. S. stockpiles. Particularly prone to breakdown were forging presses, the heart of most 105 mm and 155 mm shell lines. Many hydraulic systems had to be replaced. Gears, strained by fast output of one war, broke down in this one.

### Hand Made Parts

The shell maker had the option of hand making needed replacement parts or waiting for delivery from overburdened manufacturers. Many lathes and other machine tools from the reserves were often worn. Many times after delivery of a stockpiled tool, it had to be sent to a rebuilder for a complete reworking. This cost about $10,000 and up and contributed another 3 to 6 months delay.

Spare parts for some machines in the reserve were not easily obtainable because they were no longer being built. At that time new machine tools took up to 1½ years delivery time. When purchased new, the big presses took even longer to get, THE IRON AGE was told.

And the shellmaker who got a used tool from stockpile was required to scratch his name from the order list of machine tool builders. When the reserve equipment broke down, he was at the bottom of the list for a new replacement. In the last 3 months, money has been cracked loose in Washington so that a machine not yet dead but on its last legs can be retired and a new one ordered. Unfortunately, this happened only 3 months ago. New replacements



CUTTING THREADS in shell noses in typical assembly line operation.

are not expected before 3 months and may take up to 10 months. New tools average 10 months for delivery, heavy presses longer.

Nearly all the companies offered above as examples are just now hitting their original schedules. But it has taken 2 long years. Condition of the equipment they had to work with was a major cause. Lack of steel has never been a problem.

Most producers were delinquent on deliveries through 1952. But at least two producers have offered an additional 20 pct per month in recent weeks. This increased production brings them to the original estimated level. They don't blame Ordnance particularly, but rather the condition of the tools.

Abetting the slowdown of production have been model changes on shells already at manufacturing stages. One line has been tinkered with for 2 years and has yet to produce 90 mm shells in production lots. However, this is not in the critical calibers which are 105, 155, 60 mm, 81 mm, and 4.2 in. shells.

Industry and military production estimates were partly based on facilities that didn't actually exist. The 13,000 machine tools couldn't produce at predicted rates. The government had owned 72 ammunition producing plants (including small arms) in 1944. As these war plants were sold, leased, dismantled, or loaned to other government agencies, the number sank to 41 in 1946, then 27 in 1950. Physically, all were deteriorating.

It was suggested that one large plant be given $1 million yearly for upkeep as a standby plant. The request was turned down as too expensive. When "de-mothballed" for the current shell program, renovation cost $22 million. Much military money went into building.

Of the government standby plants available to build cannon ammunition, 40 pct were rehabilitated and operating by September 1952. They were even producing some components. For instance, one major powder plant was in fairly good shape, will reach scheduled powder output at the end of this year.

### None for Bricks, Mortar

When industry tried to put more space under roof to handle standby lines—since their own lines were not operating well—the government said no "bricks and mortar" could be included in the facility contracts. The money had to go for machines and materials and manpower, all scarce. One manufacturer offered to donate $55,000 of his own cash to house a standby forging press. He was refused the press. Designed to protect the government from fly-by-night operators, this ruling was sometimes a drawback.

The Senate investigation may swing to earlier machine tool shortages as a shell shortage cause. There's plenty of evidence, much-discussed before but very pertinent now. The machine tool builder wasn't given a priority system until late in 1951, when his order book was as fat as *Thomas' Register*. He was held back on subcontracting by not lenient price controls. Despite the steel priorities system, he had a bad time procuring some heat-treated steel grades.

# WAREHOUSE: Precision Piles Up Profits

**Highly accurate re-rolling, slitting and other processing supplements normal distributor functions . . . Note mounting demand for close tolerance materials—By *R. L. Hatschek.***

"You're the kind of customer we want." That's what Eastern Brass & Copper Co. said to an electronics manufacturer whose specifications were too tight for other metal suppliers. Eastern is not only a warehouse doubling as a metal processor, they'll do the processing to closer tolerances than most mills.

Do these close tolerances pay off? Eastern executives point out that their prices are higher and their deliveries are slower but customers keep coming back for more. And there's a continually increasing demand for high precision from communications, instruments, aviation, radio, radar and similar industries.

### Rate on Quality

At the recent SAE meeting in Cleveland, a trend was noted to evaluate suppliers by their quality control. With stepped-up emphasis on automation, higher precision in materials is required to prevent stoppages in rapidly moving production lines.

NPA, in a letter recommending that the firm get a material allotment for expansion, called it "the only company in the brass industry capable of precision re-rolling and slitting of ferrous and nonferrous metals and converting obsolete material into usable condition."

### Slash All Tolerances

Slitting is done in widths from 3/64 in. to 36 in. in increments of 0.001 in. to an average tolerance of less than half the ASTM standard. And for special jobs they'll cut that tolerance to a tenth of commercial specifications.

This "warehouse" also has a four-high rolling mill and five two-high mills on which re-rolling is done to tolerances as close as ± 0.0003 in. They'll flatten sheet to as little as ± 0.0005 in. across the crown. And to assure the proper temper, the company has a controlled atmosphere annealing furnace.

How did Eastern get that way? It all goes back to the founder and president of the firm, 71-year-old Abe Barchoff. He's a real craftsman with a bent for machinery. His son Herb, vice-president of the company, calls his father "a fussbudget" on accuracy—and he's made it worthwhile.

### Build Own Machines

And how does Eastern stay that way? Part of the answer is a well equipped machine shop, unusual in any warehouse, for maintenance, repair, rebuilding and even building from scratch the production machines for processing metals.

Here were built a pair of machines that round-edge, pinch-pass, straighten edgewise and flatten strip in a single pass. Roll flatteners were combined with shears and equipped with microswitches, producing one-man-operated machines that will flatten coiled strip and cut it to length.

It was recently decided to install a small boom-type crane in a busy corner to leave the trolley cranes free for other jobs. Inquiries showed the price high and delivery slow. So Eastern built one itself. This is typical of the firm.

### Train Own Men

Rather than hire men with bad habits, Eastern prefers to train its own production workers. This preference is so strong that only one man now employed by the firm knew how to operate a slitting machine when he came to work there. And he came there 18 years ago, is now works superintendent.

It isn't a big outfit. It employs a total of about 85 persons, of whom about 50 are production workers. Plant floor space is about 45,000 sq ft exclusive of offices. But thinking is progressive. Management is not afraid to scrap machines or methods if better are available. Steel and aluminum are relatively recent additions to the copper and brass stocks carried since the firm's beginning.

Awards are given for good production ideas and output is being stepped up now with the installation of an incentive system. Employees already on the incentive basis are taking home an average of $10 a week more. And company executives feel that production will be doubled when all workers have the incentives.

GUIDING HAND is extended by Eastern Brass president Abe Barchoff in building of special round-edging machine in plant machine shop.

# HOUSE ORGANS: Liked, Believed, Read

**Employee publications have high readership at all levels, study finds . . . Rated best source of information about company . . . Can tell management's story—By G. G. Carr.**

Don't kid yourself about your house organ. Employees rate it the No. 1 source of information about your company. They like it, they believe what it says, and—ultimate test for any publication—they read it.

Employees want to know the economic facts of life. They're perfectly aware that sales keep their pay envelopes fat. A recent survey found that the most read item in Dravo Corp.'s *Dravo Slant* is a listing of bids made by the company and its competitors, and final letting of awards.

### Bids Are News

Nobody claims glamor or great writing for these terse items. But researchers for Assn. of National Advertisers found that 84 pct of all employees looking at the publication read at least part of the column. And 83 pct read two-thirds or more.

To determine readership, the association surveyed six major companies: Dravo Corp., Pittsburgh Plate Glass Co., General Electric Co. (Schenectady Works), Delco-Remy and Pontiac Divs. of General Motors Corp., and Aluminum Co. of America.

### Rank It First

In each case, workers by a substantial margin listed their company house organ as the best available source of information about the firm or division. It outranked such sources as supervisors, city newspapers and unions.

In a list of 16 information sources, supervisors ranked fourth, city newspapers fifth, union newspapers tenth, union stewards eleventh and union meetings twelfth. Company advertisements followed in thirteenth place and bulletin boards one notch below. Supervisory dinners trailed the list.

Workers seem to shed any latent hostility to management when they pick up the company's publications. Ninety-seven pct of those interviewed said they believed what they read in company publications.

Management has a fine opportunity to tell its story in house organs. But it must be careful not to take advantage of workers' trust in its publications. Inaccurate or misleading statements will eventually be spotted. And one slip can wreck a whole campaign.

House organs get read and read thoroughly. In the plants studied, 90 pct of all employees had read or looked through at least one of the two latest issues. Very few publications of any type can claim as good a rate.

And readership isn't limited to workers. Those queried indicated that generally at least one other person in their homes read company material. Two-thirds of these outside readers were women, presumably wives.

### How They Rank

Employee's Opinions of Company Information Sources

1. Company Publication
2. Plant Publication
3. Group Meetings with Supervisors
4. Individual Talks with Supervisor
5. City Newspapers
6. Other Workers
7. Information Racks
8. Company Meetings
9. Radio
10. Union Newspapers
11. Union Steward
12. Union Meetings
13. Company's Advertisements
14. Bulletin Boards
15. Television
16. Supervisory Dinners

Women's readership is heaviest in the younger age groups, drops off sharply after 40. Some firms include features on homemaking and similar items to reach the ladies, even though practically all their workers are men.

In plants employing both men and women, readership is about the same for both sexes. Rate is fairly constant for all age groups, but rises with educational level. And salaried employees read more than wage earners.

### Worth 1000 Words

Pictures do better than words; photographs and cartoons get the most attention of any item. Recognizing this, many companies use cartoons for economic and political messages. A cartoon on socialism in *Alcoa News* scored 70 pct with readers, and a comic strip on the welfare state was read by about two-thirds of *GM Folks* readers.

Of the magazines studied, only *Dravo Slant* carried specific sales reports. But its high readership proves the appeal of this type of information to employees.

Sectionalized news of departments is sought after by readers, but they tend to read only about their own departments. News in "tidbit" style is welcomed and read thoroughly.

Personal items are well read, and "Have You Met" can provide occasions for executives to outline company policy in their fields.

### Sell Our System

It's pretty standard practice to include educational material in employee publications. Health, safety, suggestion plans are commonly covered, well read.

Some companies are now adding material on economic and political subjects. This is well received by readers, particularly when signed by the president or other executive of the company.

A good many women workers were found to be doubtful on economic matters, a fact that management should keep in mind when preparing educational materials for publication.

# ARBITRATION: Don't Go to Court

**Settling a dispute by arbitration is faster and cheaper than a lawsuit . . . Decision is like a court order . . . Can be used to solve almost any controversy—*By E. C. Kellogg.***

"I've been sitting here patiently for quite a while now and I think it's about time that I get a chance to say something. . . ." This informal interruption of a witness' testimony is typical of many that cropped up during a private arbitration hearing which THE IRON AGE sat in on last week.

The dispute was being thrashed out in one of the hearing rooms at the American Arbitration Assn.'s New York headquarters. It concerned a contract disagreement between a record company and a world-famed orchestra conductor, but it might just as easily have been an argument between a jobber and a manufacturer, or a labor-management controversy over reporting pay.

### Anybody Can Use It

For the last 27 years, the American Arbitration Assn., a non-profit organization, has made it possible for industry, labor, business and private citizens to obtain swift, inexpensive justice without becoming embroiled in costly, interminable law suits.

Last year more than 2000 disagreements, ranging from picayune tenant-landlord bickerings to multi-million dollar corporation disputes, were settled through the arbitration facilities offered by the AAA.

### Handles All Types

Largest settlement ever handled by the association was a $4 million dispute between the Netherlands government and an arms manufacturer; the smallest, an award of $1.47 for a faulty drycleaning job.

Most publicized case in AAA files concerns the pregnancy of actress Helen Hayes which a play producer termed an act of God in an attempt to avoid paying the entire cast 2 weeks dismissal salary. The arbitrators decided against the producer on the grounds that the play could have continued if another actress had been hired as a replacement for Miss Hayes.

But most of the association's cases are of the meat-and-potatoes variety, such as a recent dispute concerning a high-pressure pump explosion in an oil refinery which resulted in a disastrous fire.

The refinery blamed the accident on the pump manufacturer, stating that the pump was defective. The manufacturer countered that the refinery had been negligent.

The two parties realized that the business of both firms would be hurt if these charges were picked up by the press during court hearings. They decided to arbitrate, and in complete privacy the manufacturer won the award. The decision was as binding as a court order.

### Process Is Easy

For any person or firm interested in settling a conflict informally, inexpensively and out of court, the process is simple. Best method is to include a clause in all contracts stating that disputes will be decided by arbitration.

But if there is no arbitration provision when a conflict develops, the two parties need only sign an agreement that they will arbitrate according to association rules.

After sending the AAA a brief account of the controversy, they are mailed a list of names of possible arbitrators. All of the arbitrators are prominent men, experienced in the particular field involved.

Both parties indicate their preferences for an arbitrator, and the association selects the one most acceptable to both groups. Usually one or three arbitrators are chosen and, with the exception of labor-management hearings, they serve without pay.

The AAA sets a time and place for the arbitration hearing which is convenient to both parties. Since the association has a file of 13,000 arbitrators in 1600 cities and 48 foreign countries, it can supply an

When parts must function repeatedly without fail, aircraft designers specify beryllium copper, a unique alloy with a multitude of desirable properties. This Lockheed Constellation serves to show where beryllium copper parts can be found in many modern airliners. For parts, see below.

# VERSATILE BERYLLIUM COPPER

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In World War II, Berylco beryllium copper was drafted for the production war on many fronts. It did amazingly well. For aircraft, it improved such things as radar equipment, altimeters, valve guides, plug type connectors.

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In fact, nearly every industry today is aware of the part Berylco can play in making better, cheaper products. By offering the designer combinations of such desirable properties as elasticity, fatigue resistance, strength and conductivity, Berylco can often solve design problems involving conflicting requirements. And it can do so at low cost and with the utmost reliability.

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*Tomorrow's products are planned today—with Berylco beryllium copper*

These Berylco parts—a few of those used in modern planes—are numbered to indicate where they appear in the large photograph. (1) Propeller bolts; (2) fuel injector; (3) de-icing stud; (4) instrument switch part; (5) instrument diaphragm; (6) connectors, plug-type and coaxial; (7) safety belt release.



arbitrator to settle an argument on almost any subject, anywhere.

### Settlement is Quick

Some arbitration hearings have been arranged, staged and an award granted in only a few hours. Other cases have taken longer, but the time lag is always much less than is required in formal litigation.

Cost of arbitration is surprisingly modest. Average fee amounts to 1 pct of the claim involved. In large claims, the charge is downgraded to 1/10 of 1 pct of everything over $200,000. Minimum charge is $25. Labor arbitration fees are set at $25 per party per hearing.

### Can Meet Anywhere

Additional expenses may include items such as stenographic costs and rent for hearing rooms, though conferences can be held in the corner drugstore if the parties feel so inclined.

Most contestants hire lawyers. This is an additional expense—but is much less than if the lawyers had to make elaborate preparations for a court hearing.

In one case in the association's files, litigation was tried before arbitration. The case was in court for 6 weeks, cost $9000 and resulted in a hung jury with no decision.

With arbitration, the dispute was settled in 9 days at a cost of little more than $500.

### Stops Strikes

Arbitration has been used most frequently to settle labor-management grievances. Dept. of Labor estimates nine out of ten labor contracts contain an arbitration clause —recognition of its value as a strike-preventer.

Wisely, both management and labor discourage use of arbitration in working out new wage contracts. Association spokesmen believe this problem is best settled by negotiation.

Use of arbitration is also increasing in conflicts between business firms in different countries. The AAA regards advancement of international arbitration as one of its most important functions, since it believes friendly trade relations are the best way to achieve peace.

# FOREMEN: How to Pick a Good One

**Selection of foremen is becoming a science . . . Psychologists, personnel men important in new trend . . . Psychological testing and group appraisal eliminate guesswork—By *R. M. Lorz.***

Somewhere along the line the humorous but not too modern "Bull of the Woods" type of foreman has retired—forced out by more systematic approaches to management-foremen relations.

Old and sometimes haphazard techniques of foreman selection and foreman training—such as staff meetings, indoctrination by pamphlets, the foreman's course—are being heavily supplemented by scientific techniques of personnel management.

### Psychologists Take Over

Industrial psychologists and personnel men are playing a prominent part in the switch-over. Analysis of the job the foreman must perform is an exacting procedure, and to select the right man for the job many firms are using the personnel profile system.

Instead of guessing about a man's ability to be a good foreman, firms using this system also keep personnel records of success, effort, personal qualities.

Under the profile system of personnel evaluation, industrial psychologists test supervisors or potential supervisors to pinpoint the characteristics which can either make or break them as suitable leaders. Scores are charted on a horizontal bar graph which determines an employee's profile.

### Use Profile System

The technique is still new and those using it are quick to admit the system isn't foolproof. But it is a concrete approach to the mechanics of supervision which have too often been the subject of guesswork.

Many firms also favor psychological testing. From test results it is possible to get an objective evaluation of a man's intelligence, temperament, qualifications as a leader and ability to handle the responsibilities of a more important job.

Another method that can be used alone or in addition to psychological tests is the group appraisal approach in which candidates for a foreman's job are judged by a group of men familiar with their assets and defects. A typical group might be composed of the foreman candidate's immediate superior, other foremen who know him, the plant manager and personnel director.

This group can rate the man being considered for promotion on factors such as: Background, knowledge, skill, leadership and potential.

After each member of the group has rated the man independently, the evaluation of the whole group can be determined. It should tell fairly accurately whether or not the man is of foreman calibre.

### Will Men Want Him?

No matter what selection method is used, management must always determine whether a man being considered for a foreman's job will be accepted by the workers. Most firms have learned that employees allow the foreman to direct them rather than accepting the foreman's authority just because he is a foreman.

"They expect it of me occasionally."

Training of first-line foremen has also undergone some changes. Courses in shop math and advanced milling machine techniques are still used but they are now part of the larger approach.

### Teach Free Enterprise

In addition to periodic staff meetings and routine orientation on foreman problems, many large firms are teaching their men something about basic economics. Program was started by executives who wanted to put real meaning into the words "free enterprise."

At first glance the connection between hard-hitting production men and economic theories seems tenuous, but foremen who have taken the course don't feel that way. They claim their introduction to economics has sharpened their ability to do a better job on production, quality control, cost reduction and industrial relations.

### Make Them Managers

Since all concerned admit that foremen have to be everything from domestic troubleshooters to production wizards, steps are also being taken to make line foremen an integral part of the management team.

In the past, too many top executives have been content to allot special parking spaces and shop coats as the only sign of the foremen's importance. One farsighted executive doesn't believe this is enough. He says: "The foreman's badge and space in a special dining room are fine, but in my opinion the only way to really make foremen working members of the team is to give them more power to make decisions that count."

### Foremen Budget Departments

Firms guided by the same kind of thinking have done just that. In some plants the man who is closest to production hires his own men and does his own budgeting, in addition to handling detail work. There are no complaints from the men about being overburdened be-

cause they feel that their job is important.

Management communications systems can also stand some overhauling in the opinion of many responsible executives. In large plants this is a problem, but everything possible is being done to substitute personal contact for paper work.

Chief need in this respect is speedier communication from top to bottom. In many instances foremen have been kept in the dark on policies long after the men under them had been informed.

In order to remedy this problem, many firms are insisting on an active program of consultation in which the foreman not only learns but also has a chance to shape policy.

## More National Steel Expansion

National Steel Corp. is contemplating an $85 million expansion and improvement program at Weirton Steel Co., including a new electrolytic tinplate line. The money would be spent over the next 3 to 4 years and would bring cost of National's post-war building program to nearly $450 million.

E. T. Weir, chairman, said the decision whether to go ahead depended to some extent on tax relief, particularly elimination of the excess profits tax after June 30. But he gave the impression the program probably would go ahead.

The Weirton expansion program will be solely in finishing facilities and will include, in addition to the new electrolytic line, expanded facilities for producing galvanized sheets and zinc-coated sheets. The 4-high 54-in. continuous hot mill will be rebuilt into a 66-in. mill. Weirton's tinplate capacity would rise approximately one-third, from 22 million base boxes to approximately 30 million.

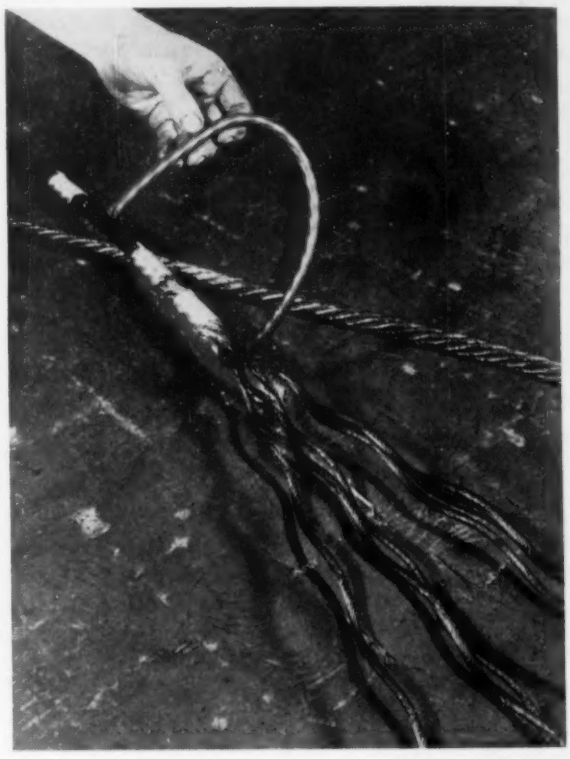
Mr. Weir hinted that perhaps another openhearth furnace will be added at Weirton. He said the company has no immediate plans to develop the 2000-acre eastern mill site. National also still holds title to a 1000-acre plot along Lake Michigan in the Chicago area.

Equipment

# Plastic Wire Rope Core

After 6 years of development work, Jones & Laughlin Steel Corp.'s Wire Rope Div. at Muncy, Pa., is producing and selling a wire rope with a plastic core in place of the hemp core of traditional use.

Eventually, this product may account for 50 pct of the production from this plant, with the other 50 pct represented by all-steel rope. Stocks are available at J. & L.'s 88 stores and through other distributors.



PLASTIC CORE: J & L is producing wire rope with a plastic core at its Wire Rope Div. in Muncy, Pa. Plastic replaces traditional hemp core, eventually may account for 50 pct of J. & L.'s wire rope production.

The plastic core rope lessens dependency on foreign sources for fiber used in production of hemp cores. J. & L. had been using 70,000 lb of hemp per month. If adopted industry-wise, hemp consumption in this country would be off 9000 tons per month assuming a 100 pct shift to the plastic core.

J. & L. indicated the plastic core rope increases production costs but customers are paying the same price as they did for the hemp core rope.

Principal application of the new product will be in the drilling of oil and gas wells by the cable tool method. The polyvinyl chloride core is unaffected by acids, caustics, and other substances that destroy the fiber cores. Other applications are expected to develop.

Other advantages of the plastic core include: resistance to moisture; maintenance of resiliency; joint strength identical with the material itself; non-absorption of water, and uniform strength throughout.

The Muncy plant is prepared to manufacture the plastic core rope in diameters ranging from $\frac{3}{8}$ in. to several inches, in lengths as long as 40,000 ft.

# STEEL: Union Holds All the Deuces

**USW's McDonald has weak case for big wage hike . . . Price rises hang fire . . . Atlantic City meeting will furnish wage demand clues . . . What the union's up against—*By J. B. Delaney.***

Dave McDonald's first encounter with the steel industry as president of the United Steel Workers of America will be no picnic—for Mr. McDonald. Meanwhile steel price rises hang fire pending outcome of approaching wage negotiations.

Mr. McDonald's bargaining position is weak. Too many things are running against him, too few for him. He will probably get a modest wage increase—maybe as much as 10¢ an hr.

### Clues at Atlantic City

Under more favorable circumstances, Mr. McDonald might have been tempted to use the forthcoming negotiations to make a name for himself in his first test since former USW chief Phil Murray died. But he is not likely to chance trying to make himself a hero this year. It may be wise for him to wait for a better opportunity later.

An idea of what the USW will ask for when it requests reopening of industry contracts will come Apr. 27 to 28 when Mr. McDonald meets with his International Executive Board and International Wage Policy Committee at Atlantic City. It's assumed the union will ask for a "substantial" pay hike.

Negotiations will be limited to wages. Industry contracts are specific on this point. Even if negotiations break down and a strike occurs, which isn't likely, other matters cannot be brought up at this time. The union must ask for a reopening on or before May 1 and a strike may occur any time after June 30 if no agreement is reached.

### Strike Spirit Flattened

No one expects a strike. In fact, Mr. McDonald would have a tough time whipping up rank-and-file enthusiasm for a walkout unless some new hot issue materializes. The loss of an average $600 in last year's 54-day strike still rankles the steelworker. Some speculation has centered on whether the union might try to torture wording of the contract to ask for a guaranteed annual wage. But this talk is scoffed at by industry people. This issue has cooked in the pot many times before with no results. So far the union has used it as a bargaining lever.

Hard-pressed to find solid ground for anything but a modest pay boost, Mr. McDonald can find no comfort in the cost-of-living angle. Living costs have been going down and no sharp rise is anticipated. In a recent issue of *Steel Labor*, official USW publication, the union boasted that steelworkers' wages have more than kept pace with living costs.

### No Peg on Profits

Compensation for productivity increases might be resorted to in bargaining. But the industry will answer that incentives take care of the worker's share of improved productivity benefits.

Industry profits certainly will not provide the peg to hang a strong wage demand. A survey last week by THE IRON AGE shows that industry earnings last year were off more than 22 pct from 1951, itself a poor profit year in relation to 1950. Last year's average wage increase of 25¢ an hr coupled to a too-small price advance under price controls made a poor combination from an industry earnings standpoint.

"Never mind Uncle Sam. How much are you withholding?"

With the Eisenhower Administration, the union will not get the favorite child treatment accorded by the Democrats. Impartiality is the new Washington slogan, supplemented by the announced wish that labor squabbles be settled without government interference.

### Prices Hinge on Wages

Steel prices are tied to the outcome of the wage negotiations. Although some "extra" adjustments may be made in the meantime, steel users will probably continue paying present prices until wage negotiations are settled.

When they come, price increases will be no more than enough to cover higher costs, including wage costs. The industry feels it is entitled to make a profit on all products and that too many items for too many years have been marginal. If the steelworkers win 10¢ an hr, the price advance might average around $4 per ton. Some products would rise more than that.

Often lost sight of outside the industry has been its inability to profit from its multi-billion-dollar expansion and improvement program and accompanying increase in productive efficiency. The mills had been counting on this to improve their profit position and bring better returns to stockholders.

## USW Seeks Medical Benefits

United Steel Workers president David J. McDonald, speaking before the annual conference of Blue Cross and Blue Shield Plans, warned the steel industry that he will demand substantial improvements in medical and surgical benefits.

He asserted that unless an adequate program is achieved privately, compulsory federal insurance is the

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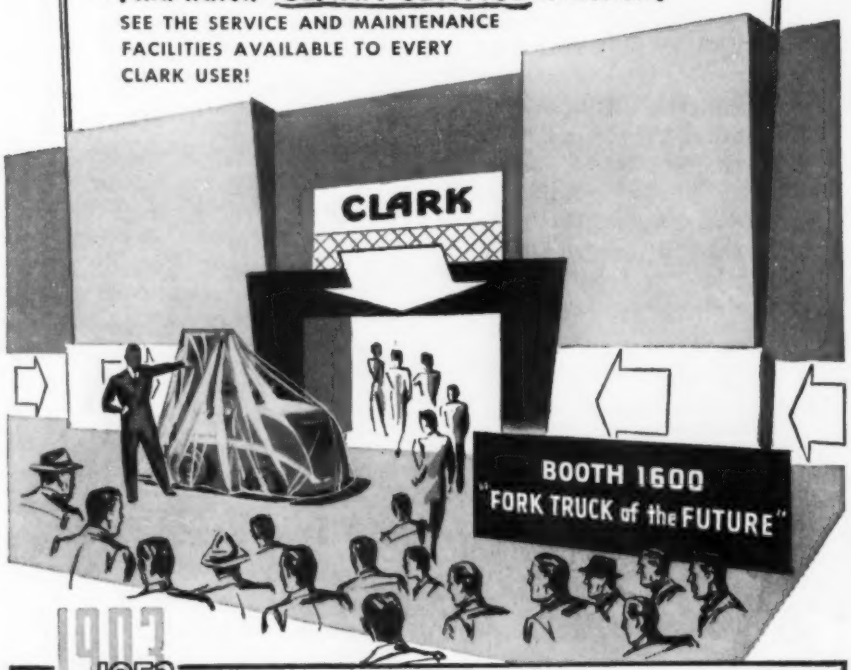


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—Research—

# ULTRASONICS: Test

**New instrument measures viscosity continuously, accurately . . . See many uses.**

How gooey is a fluid? That's an important question in many industries today. And up to now it has been impossible to get a really quick measurement of viscosity.

But ultrasonics have provided a means for continuous, rapid and accurate checking of viscosity—even while the fluid is being processed. Production of the machine, called the Ultra-Viscoson, will start immediately at Bendix Aviation Corp.'s Cincinnati Div.

A thin alloy steel blade is vibrated at ultrasonic frequency in the fluid being checked. Effect of viscosity on the vibration of the blade is transmitted to an electronic computer.

This is connected to a recorder which continuously graphs viscosity and it may also be connected to a device for controlling the process if the flowability should deviate beyond desirable limits.

Even beyond this obvious ad-

—Labor—

*Continued*

only alternative. And, he said, there is no reason to believe the Administration is unalterably opposed to federal health insurance.

This is what he proposes to ask for early next year in improved social insurance: (1) Early diagnostic and preventive medical care. (2) Payment of medical, dental, drug and appliance bills. (3) Payment of all hospital bills.

Present program provides that workers and companies share premium cost of medical insurance, which generally provides payment of $8 per day hospital bills, $200 maximum surgical benefits, $120 for special services, and sick benefit payments for 30 weeks.

Mr. McDonald said current agreements require workers to pay more than $30 million annually in premiums for benefits to 1.5 million members and their families.

## Fluid Viscosity

vance, the instrument can be used to check fluids in either high-pressure or vacuum chambers. And it will operate in a temperature range of from minus 200°F to plus 650°F. These factors extend the testing range far beyond any that previously were practical, or even possible.

The probe which carries the vibrating blade is designed for permanent installation in the pipeline, kettle, fractioning tower or other container where the fluid is being processed.

Applications of the instrument, invented by Mr. S. R. Rich and Dr. W. Roth, can be found in any industry in which such a measurement is of value. There are many.

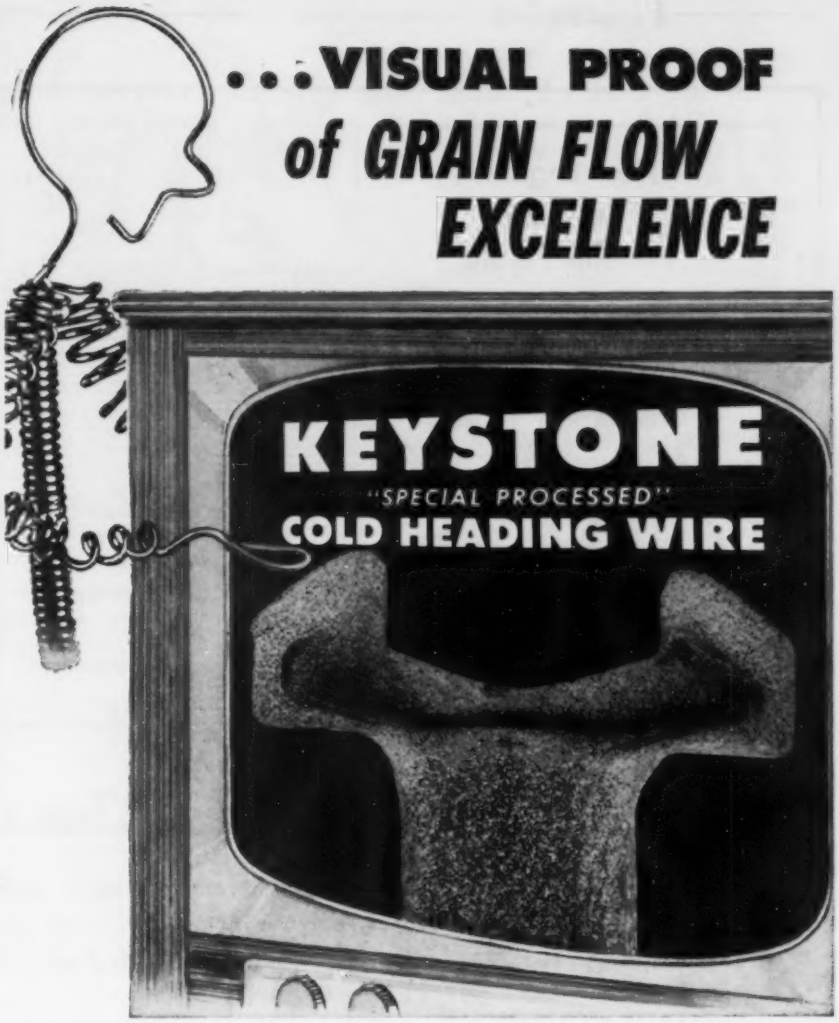
### Checks Six Kettles

The petroleum industry, which calls the device "an automatic dipstick," finds it useful in the separation of different weight fractions in the refining process. And in the final blending fuels and lubricants the machine makes possible the close control of thickness.

Measurement of viscosity is vital in the production of plastics of all types, bonding agents, paints and finishes. One version of the Ultra-Viscoson being specially-built for a plastics producer will have six probes combined with a single computer. This machine will continuously check what's happening inside six different kettles.

All sorts of chemical processes can utilize the machine. Used to check a pilot production cycle, the machine enabled one chemical firm to analyze its method. The analysis showed how to cut the operating method from 8 hours to 2, a reduction of 75 pct.

...VISUAL PROOF of GRAIN FLOW EXCELLENCE




The above macrograph offers visual proof of the uniform grain flow characteristics in a recessed-head screw made from Keystone "Special Processed" Cold Heading Wire. The continuous, strength-giving flow lines indicate efficient cold heading which results in longer die life, increased production and a better finished product.

The following analysis of "special processed" wire is recommended for difficult cold heading.

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C1006–C1022 for Phillips Heads
C1108–C1109 for Phillips Head Wood Screws
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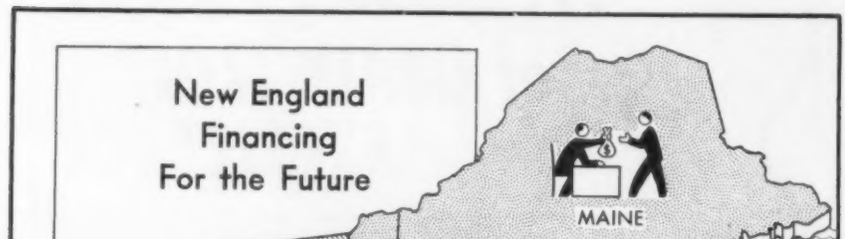



# NEW TREND: Gives Small Firms a Chance

**Bold action getting venture capital for promising small business . . . Communities, states, private firms take risks but make money . . . Complementing banks—*By W. V. Packard.***

A new trend in financing is making comfortable homes for small business in New England. It's also going a long way toward building a solid base for industrial development and providing recession-depression insurance for one-industry communities.

The New England Council says "It's no wizardry — that Main Street knows what happened." But to an outsider it looks like the best method yet found for solving one of small business' biggest problems—the need for venture capital or long-term credit.

### Drive is Triple-Pronged

Actually the Yankees are attacking this problem three ways:

(1) Two private corporations have been formed to supply or obtain venture capital for new enterprises based on new products or new production techniques.

(2) Local industrial development foundations are helping meet the need for long term credit in 37 communities. They have added 27,000 jobs in small and medium-sized communities and have increased annual payrolls by $75 million. That's why Main Street knows what happened. Town merchants feel the difference.

(3) State industrial development corporations have been set up in three states—Maine, New Hampshire, and Rhode Island; legislation is pending in Connecticut and Vermont; and business and financial people are beating the drums hard in Massachusetts. Within a year every state in New England could have a state industrial development corporation.

### Takes Chances

American Research and Development Corp. is perhaps the boldest experiment yet tried for providing risk capital to new product enterprises. This risk-taking corporation was organized in Massachusetts in 1946 to help finance new companies based on new products which show technological promise. It not only advances equity or credit, but it also works closely with companies in which it invests to help assure success.

It's a closed-end type of investment company, with 300,000 shares of stock publicly held. So far it has invested $5 million in 25 companies. About 80 pct of investments are already operating in the black. Brightest child of the corporation is well known Tracerlab, Inc., which did $11 million of business in atomic energy instruments and accessories last year.

### Risks Pay Off

Though AR&D is supposed to take risks, it has operated in the black for the second consecutive year (profit before taxes last year was over $100,000.)

New Enterprises, Inc., also located in Boston, works with the same purpose but a different method. It investigates and screens prospects for new product firms and passes recommendations to associated individual investors who act as they see fit.

Perhaps even more important than the activities of these two private corporations is the startling growth of local industrial development foundations.

### Idea Catches On

Idea isn't new; the oldest one dates back to 1912. During depression of the early 30's the idea gained new adherents, with nine new foundations being formed. Activity of the early foundations was aimed chiefly at acquiring vacant industrial plants and trying to find virile tenants to increase the flow of business blood in hard-hit communities.

But the greatest surge has come since World War II; 27 community development foundations and corporations have been formed since 1945. Altogether, there are now 37 of them fully organized and operating in the six-state area. They have added 27,000 new jobs and $75 million to annual payrolls.

Nearly all these additions are small business and nearly all are stimulating business in small and

medium-sized towns. Most active are communities of 5000 to 15,000 population, especially if they are one-industry towns.

### New Hampshire Leads

Breaking them down geographically, it is found that New Hampshire has the most—19. Maine has 7; Massachusetts, 6; Connecticut, 3; Vermont, 2. Several more are currently in the planning stage, as additional communities see the success story repeated.

*The community development corporation is not a panacea for a dying town. As a matter of fact most of them have been organized as long range civic programs to stimulate industry and business—not as stopgap measures to offset loss of a departing plant.*

Communities have followed no set method of forming and operating business stimulation foundations. Of those now operating, 22 were organized with an eye for possible profit while 17 are considered non-profit foundations. All place industrial expansion before profit.

### Keep Shares Cheap

Average authorized capital structure is a little more than $100,000; average capital actually paid in is about $64,000. Most popular method of raising capital has been sale of stock. Low price per share, usually $1 to $10, has kept ownership broad. Broad ownership is considered important since it assures direct interest of many people in the town.

Interest of townspeople is vital. Many companies looking for a new home or a new plant site put civic interest in acquiring a new plant at least on a par with the usual factors of water, power, transportation, taxes, labor supply, and government.

Hardest obstacle they have had to overcome has been apathy. Staunchest support usually comes from professional and business people — chambers of commerce, newspapers, lawyers, bankers. At least one energetic leader is needed to convince some of these people that a community organization can get things done.

Although local development corporations started by buying and renting plant space, they have turned to building new plants when opportunity arose but adequate plant space didn't exist. One local organization has built eight plants, another six. Thirty-two have said they would build if necessary and 15 of them have built a total of 27 plants for 29 companies.

Nearly all have put all their capital to work, and 15 have borrowed from banks. Altogether plant space has been sold or leased to nearly 300 manufacturers.

Despite the fact that profit is not the main motive of these local development corporations, they don't look bad when measured by that yardstick. Few, if any, are in the red. Some 15 have paid yearly or liquidating dividends and four have actually paid back more than the original investment. Eleven that have not paid any dividends have been able to show increased business in their communities.

The Maine Development Corp. (first of its type) was established by special charter from the state legislature and started operating in May 1950. Its modest capitalization of $50,000 has been built up to a borrowing potential of over half a million dollars. Member banks and other financial institutions are on call to provide loans up to 2½ pct of their own capital and surplus.

The state development corporation operates somewhat like the local groups. Big difference is that operations are state-wide.

### Don't Compete With Banks

Neither the local nor the statewide development corporations compete with banks or other lending institutions. Most of them are not authorized to make loans that a bank is willing to make.

Actually they complement the existing banking system, making more business for lending institutions. In a number of instances they have uncovered information that caused banks to change their minds after loans had been refused. Once convinced of the advantages of local and state development corporations, bankers have been among the staunchest boosters.

## Tough Problem for Small Business

Nobody faces tougher problems than the small business man. And probably nobody gets more lip service and less real help. One of the toughest problems he faces is getting venture capital or long term credit.

There are a number of reasons: Some of the ventures are obviously risky. Some are based on new, unproved products. Even if the firm is able to get off to a good start, high taxes make it hard to accumulate funds needed to expand. Banks are limited by law on some types of loans. Moreover, they are made cautious by the hard fact they must protect interests of their depositors.

Several types of assistance by the Federal Government have been widely publicized and have helped some (THE IRON AGE, Feb. 21, 1953, p. 56). But the need for venture capital and long term credit for small business has persisted, with spotty attention at state and community levels.

It is not surprising that New England leads the nation in state and community self help in meeting the problem of small business credit. New England, with its great credit resources and background of financial leadership, is also an area of many small and medium sized plants among a few goliaths.

# MOBILIZATION: Hits Turning Point

**Defense programming due for overhaul . . . Stretchout for 20-year period seen . . . Wilson wants to concentrate defense orders . . . Opposition is strong—*By A. K. Rannells.***

A big question in Washington this week was: Which direction will mobilization programming take?

There was little doubt that defense planning is due for a complete overhauling. Proposals are a dime a dozen.

But indications were that the hassle is boiling down to two factors—acceptance or rejection of the so-called Wilson Plan, and further stretchout of the whole program.

Retrenchment is definitely in the air. Republicans still hope to make good on tax-cut promises, but the White House is standing pat on its balance-the-budget-first policy.

### Cut Military Spending

Military and defense programs seem to be best bets for pruning expenditures. Korean truce talk is building up pressure for this action.

Defense Secretary Wilson has indicated that about $4 billion can be whacked from the defense budget. Other officials, including some congressmen, agree.

Plans are already under way for a further stretchout of the defense program—for perhaps 20 years or longer, rather than the 5-to-10-year period originally planned.

### Provide Immediate Saving

One reason is to offset pressure for drastic defense cuts in the event of a truce. Such action would provide some immediate reduction in expenditures.

Another is that it would provide a backlog which could be used to bolster the national economy at a later date, if needed.

A third factor is that the defense buildup is nearing a peak with the leveling off period in sight. Under the plan which seems to be emerging, procurement would be curtailed on easy-to-make goods and on those which might become obsolete while in storage.

But first it must be settled as to how continuing defense and military orders are to be distributed among industrial firms, some of which have expanded specifically to meet government orders.

### Wilson Wants More

A well-planned leak from the Pentagon indicates that Secretary Wilson favors less emphasis on the broad mobilization phase and more on turning out arms and equipment for current needs.

This involves narrowing the current spreadout of orders and concentrating more contracts within fewer plants. Such proposals have received immediate opposition from congressmen and others.

The Wilson Plan would help trim the defense budget and at the same time help maintain high defense output. Argument is that full production in one plant is much cheaper than partial production in several.

As one official expresses it, unit cost for 15 tanks made in a single plant is much less than if 3 plants make 5 tanks each.

### Convert or Mothball

This involves a program proposed by Mr. Wilson before he went to the Pentagon as a defense official. It's the dual-plant plan.

If adopted, it would mean that a firm losing military orders would have the choice of turning its facilities to civilian production or, if facilities are not convertible, mothball them until they are needed for war or emergency production.

While this proposal has met with some favor in the capitol, opposition is even stronger at the moment. Likewise, the White House is believed to be cool to the plan.

Tip-off is that Office of Defense Mobilization is opposed to the Wilson Plan although it has said little on the subject. Since plans are to put all mobilization planning under ODM's roof, the agency's ideas are likely to reflect the thinking of the White House.

## Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Replenishment of artillery parts, $57,675, Skimmer-Moser Mfg., Saratoga, Fla.

Bearing temperature monitoring unit, 27, $225,388 Minneapolis-Honeywell Eng. Co., Philadelphia.

Pumps, oil, 16, $103,923, Warren Steam Pump Co., Inc., Warren, Mass.

Gasoline engine generator sets, 100, $200,915, Crosley Motors, Inc., Cincinnati, *Arthur J. Verax.*

Centrifugal fan, 147, $107,404, Stone Heating & Ventilating Co., Washington.

Vaneaxial fan, 1182, $653,455, Buffalo Forge Co., Washington.

Motor, 75, $118,115, General Electric Co., Washington.

Cylinder, 253 ea, $559,458, Besler Corp., Oakland, Calif.

Strut and duct assy, var, $165,413, United Aircraft Corp., Dallas, *W. H. Haugh.*

Heat exchanger, 169 ea, $53,233, Stewart-Warner Corp., Indianapolis, *A. N. Phillips.*

Valves and strainers, var, $81,519, Aero Supply Co., Corry, Pa.

Pump assys for var aircraft, var, $337,837, Thompson Products, Inc., Cleveland.

Gear and clutch pack assy, var, $130,133, Westinghouse Electric Corp., Philadelphia.

Switch assy, var, $57,174, Aero Supply Co., Corry, Pa.

Spare parts, 495 items, $67,580, Baldwin-Lima-Hamilton Corp., Lima, Ohio, *P. R. Ehrgott.*

Tanks, 440 ea, $153,970, Allmetal Products Co., Mansfield, Ohio.

Shell, HE, 60 MM, 603600 ea, $754,500, Lehigh Foundries, Inc., Easton, Pa.

Gun, auto, 20 MM, M24A1, 671 ea, $420,468, Crown Cork & Seal Co., Baltimore.

Grenade, hand, 850000 ea, $306,654, Carey-McFall Co., Philadelphia.

Plows, 100 ea, $58,623, Minneapolis Moline Co., Moline, Ill.

Tractor, crawler type, 31 ea, $400,553, International Harvester Co., Melrose Park, Ill.

Tractor, crawler type, 26 ea, $310,195, International Harvester Co., Melrose Park, Ill.

Tractor, crawler type, 11 ea, $145,845, International Harvester Co., Melrose Park, Ill.

Tractor, crawler type, 13 ea, $85,232, International Harvester Co., Melrose Park, Ill.

Gate valve section, 1378 ea, $209,456, Noland Co., Inc., Washington.

Post, barbed wire, 1357445 ea, $545,761, Franklin Metal Products Co., Culver City, Calif.

Valve, 48742 ea, $128,308, The D. T. Williams Valve Co., Cincinnati.

Decontaminating apparatus, var, $79,482, Food Machinery & Chemical Corp., Lansing, Mich.

Parts, 82369, $162,582, General Motors Corp., Detroit, *J. E. McKenna.*

Evacuation system, 19 ea, $55,400, Linde Air Products Co., New York, *W. F. Moeller.*

Spare parts for generator set, job, $72,360, Master Vibrator Co., Dayton.

Generator set, 50, $307,541, General Motors Corp., Detroit, *J. E. McKenna.*

Generator sets, 50, $602,100, John Reiner & Co., Long Island City, N. Y.

Ice plant, 15, $77,100, York Corp., Philadelphia.

Generator set, 114, $460,410, Consolidated Diesel Electric Corp., Stamford.

# Acme Steel Strapping Insures S.A. *(Safe Arrival)*

***Increases protection, and speeds packaging rate 100%***

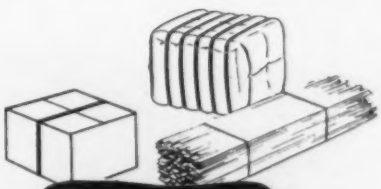
**SUCCESSFUL SOLUTION** to a difficult packing problem proved to be Acme Steel Strapping, here at the Orangeburg Mfg. Co., Orangeburg, N. Y.

Outstanding feature of sewer pipe made by Orangeburg Mfg. Co. is the material it's made of: fibers, impregnated with coal-tar pitch —non-corrosive, watertight, acid-resistant—but tricky to package.

Three different methods of binding the pipes together were tried without success. The materials either did an unsatisfactory job or proved to be too expensive.

But Acme Steel Strapping did it, doubled the packing rate, doubled the number of pipes per package. It was easy, fast, economical. And it insured Safe Arrival.

This is a typical example of how Acme Steel Strapping helped one manufacturer. Very likely it can help you. Maybe it can solve problems you scarcely know you have—but which cost you money just the same. Write to Acme Steel Products Division, Dept. 1A43.



ACME STEEL

Acme Steel Products Division **ACME STEEL COMPANY** 2825 Archer Avenue, Chicago 8, Ill.

# Sure . . . it can be DROP-FORGED

## WILLIAMS turns out jobs others turn away!

• It is not unusual for Williams to come up with the solution to difficult drop-forging problems which other plants are not equipped to handle.

Williams has broad and specialized experience plus complete facilities and equipment. Your forgings can also be milled, drilled, turned or broached. There are complete die sinking facilities . . . and the latest inspection techniques, including Magnaflux.

Call in a Williams engineer for forgings of carbon, alloy and stainless steel, aluminum, brass, bronze, titanium or monel.

Be wise . . . Buy WILLIAMS

J. H. WILLIAMS & CO.
570 Vulcan Street Buffalo 7, N. Y.


# Industrial Briefs

**Special Conveyers** . . . THE RUST ENGINEERING CO. has completed the installation of special belt conveyers to handle unloading of bauxite from a new type self-unloading ore carrier to railroad at the Port of Mobile for Reynolds Metals Co.

**Atomic Division** . . . THE BABCOCK & WILCOX CO. has established an Atomic Power Div. with C. H. Gay in charge.

**Southern Warehouse** . . . DUMAS STEEL CORP., Pittsburgh, has opened a new warehouse at Marietta, Ga., at Sessions St., in the McNeal Bldg.

**New Office** . . . GRANITE CITY STEEL CO. moved its Dallas District office to Suite 103, 3200 Maple Ave., from 25½ Highland Park Village.

**Vote of Thanks** . . . EUTECTIC WELDING ALLOYS CORP., Flushing, N. Y., awarded diamond pins to regional managers and district engineers for meritorious service and achievement.

**To Build** . . . THE BULLARD CO. has awarded a contract for an office addition and a new tool room to Edwin F. Moss & Sons, Bridgeport, Conn.

**Appointed** . . . NATIONAL FOUNDRY ASSN., Chicago, has appointed Charles T. Sheehan executive secretary.

**Worth Saving** . . . AMERICAN CAN CO. reports that approximately 257,000 tons of tin, valued at $495 million, have been saved since 1941 through the coordination of industry and government research in tinplate conservation programs in the production of cans.

**New Home** . . . FOLLANSBEE STEEL CORP. has moved to 140 Stanwix St., in the Gateway Center of Pittsburgh's Golden Triangle.

**Gets Contract** . . . The Contracting Div. of DRAVO CORP. has been awarded a contract for improvement of the Harmar Coal Co.'s barge harbor on the Allegheny River at Harmarville, near Pittsburgh.

**Birmingham Warehouse** . . . MOUNT VERNON STEEL CORP., Mt. Vernon, N. Y., will open a warehouse and sales office in Birmingham to serve the southeastern territory.

**New Distributor** . . . REYNOLDS METALS CO. has appointed Hardware & Metal Supply Co., 967-973 N. Ninth St., Philadelphia, a distributor for Reynolds architectural aluminum mill products.

**Production Up** . . . THE COLORADO FUEL & IRON CORP. reports that a new coal washery installed at its Pueblo, Colo., coke plant has raised coke production by 16 pct.

**Constructing** . . . HOOKER ELECTROCHEMICAL CO. has under construction at Montague, Mich., a $12-million-plant scheduled for completion by the end of the year. It will bring production of caustic soda and chlorine closer to the major markets of the Midwest.

**Any Problems?** . . . Engineering management and personnel problems will be discussed at an institute on "Engineering Organization" at the UNIVERSITY OF WISCONSIN on May 5-6.

**Proposed Change** . . . BURROUGHS ADDING MACHINE CO. in proxies mailed to its 29,000 stockholders made a management proposal that the 48-year-old organization's name be changed to Burroughs Corp. Votes will be tabulated at the annual stockholders' meeting in Detroit on May 7.

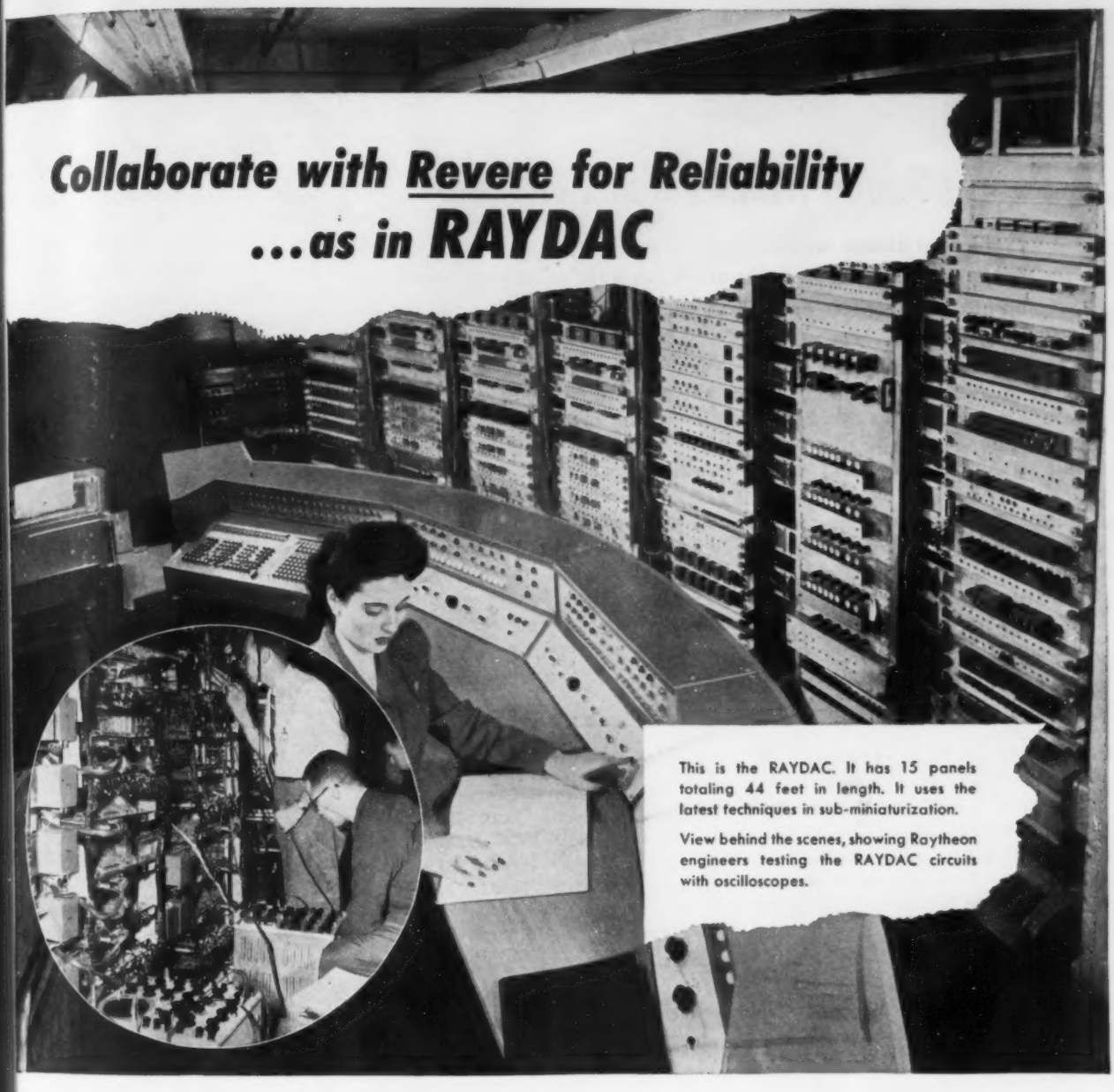
**California Branch** . . . WESTINGHOUSE ELECTRIC CORP. has established a San Francisco branch. Harold G. Rethmeyer is branch manager.

**Elected** . . . CONTROLLERS INSTITUTE OF AMERICA, New York, has elected Herbert W. Krase, comptroller and assistant treasurer of The Pfaudler Co., Rochester, N. Y., a member.

**Congratulations** . . . READY TOOL CO., 554 Iranistan Ave., Bridgeport, Conn., is celebrating its 45th anniversary as a manufacturer of centers for machine tools.

**New Coke Oven Battery** . . . WILPUTTE COKE OVEN DIV., Allied Chemical & Dye Corp., has been awarded a contract for the design and construction of a battery of 59 Wilputte coke ovens for National Tube Div., U. S. Steel Corp., at its plant at Lorain, Ohio.

# Collaborate with Revere for Reliability ...as in RAYDAC



This is the RAYDAC. It has 15 panels totaling 44 feet in length. It uses the latest techniques in sub-miniaturization.

View behind the scenes, showing Raytheon engineers testing the RAYDAC circuits with oscilloscopes.

RAYDAC means Raytheon Digital Automatic Computer, developed by the Raytheon Manufacturing Company, Waltham, Mass., for the Navy's Bureau of Aeronautics. It is an "intelligence center" to help analyze the behavior of missiles during test flights. Its importance is indicated by the fact that in a matter of minutes it can perform the calculations involved in analyzing a single missile flight, a task that would take a team of mathematicians from 20 to 30 days. The Raydac thus speeds up tremendously the development and testing of such missiles. It contains enough tubes and germanium diodes made by Raytheon, for more than 1,000 home radio sets.

In such a complicated electronic computer reliability is essential. This is achieved through design, the choice of the best materials and components, and meticulous manufacture. Revere during the past 10 years has collaborated closely with Raytheon, working out proper specifications for materials, as for example, OFHC copper. Raytheon engineers and production men have visited Revere laboratories at New Bedford, Mass., and Rome, N. Y., and many Revere specialists have studied methods and processes in the Raytheon plants and laboratories. These hand-in-glove contacts, many of them highly confidential, have proved their value.

The same kind of collaboration is open to you, and will be especially useful and time-saving if begun as soon as you have a new project on your boards. To obtain it, simply get in touch with the nearest Revere Sales Office. See your telephone book or write direct.

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# A Penny Saved Means Much to Autos

**Escalation clause wage cut of 1¢ an hr may mean savings of $400,000 per week to automakers . . . Auto price tags won't go up but higher costs are taking their toll—By *R. D. Raddant*.**

Cold economics of labor costs may have been an important factor in auto companies taking advantage of the cost-of-living index slump to cut auto workers' wages 1¢ per hr.

Since the cost-of-living clause uproar started early this year, discussion has generally been confined to long range strategy. Such high sounding terms as "living documents" have been applied to the 5-year contracts between auto companies and the UAW.

**A Penny Saved** . . . Watchers of the auto labor situation tend to forget that a wage cut of a single penny may enable automakers to shave about $400,000 a week from labor costs for the next 6 weeks. This is a sizable sum to pick up by the saving of a penny per hr. Actually, it could run into a bigger figure because a large number of the 1 million auto workers get overtime when each 1¢ becomes 1½¢.

It would be wrong to say auto prosperity hinges on such a small thing as a tiny cut in wages. But it ranks importantly especially if other competitive and cost factors are considered. Only recently Chrysler Corp. cut prices on their new cars. These cuts were based on a need to stimulate sales, particularly in some directions where certain cars were not moving as well as desired.

**Why Heavier Costs** . . . There have been no strong indications that other companies intend to follow suit. While it is obvious that prices can't go up, many costs are climbing and most automakers are resigned to a boost in steel prices.

Furthermore, the large production of cars has been paid for in heavy costs of conversion steel, extra manufacturing costs due to stretching available supply, and some damage bills caused by a lack of uniformity in sheets and strip—particularly after the end of the steel strike.

The pay drop would have caused no explosion on the labor front had it not been for the recent row over changing the cost-of-living index. The current revision of the index was issued a month late because it was first abandoned last January, then reinstated despite UAW protests.

**Automotive Production**

*(U. S. and Canada Combined)*

| WEEK ENDING | CARS | TRUCKS |
|---|---|---|
| Apr. 11, 1953 | 143,421* | 32,101* |
| Apr. 4, 1953 | 138,648 | 31,919 |
| Apr. 5, 1952 | 96,093 | 27,037 |
| Mar. 29, 1952 | 97,371 | 28,297 |

*Estimated Source: *Ward's Reports*

In review, the contracts provide that for each 1.14 pct change in the index, wages gain or lose a cent. UAW officials asked that no change be made at this point, contending that the index was issued late and not in the same form as in the past.

**Counterattack Coming?** . . . But auto companies pointed out that because of the delay in publishing the index, the decrease in the allowance actually did not become effective until 6 weeks after the regular review date. In addition, auto companies add .8 to the index to compensate for higher rents than reflected in the index.

After the cut, auto workers receive a cost-of-living allowance.

Meanwhile, except for murmurings on the UAW front, things were quiet. It was generally believed that some counter moves are planned, but whether they will be in the nature of psychological warfare or actual fighting is uncertain.

Probably action will wait until the meeting of the international UAW-CIO executive board to be held on Apr. 28.

**Hp Holds Edge** . . . Your 1953 car is a moderate 11 lb heavier than last year's model, but is pushed by 10 more hp than powered your 1952 job.

This is the principal conclusion drawn from the composite tabulated by *Ward's Automotive Reports*. The composite is made up of 18 cars, listing shipping weight for a four-door sedan, advertised brake hp, lb per hp, and cylinder displacement in cu in.

The 1953 composite weighs 3573 lb, has 143.8 hp with an average of 29.3 lb per hp. The figures in 1952 were 3562 lb, 133.6 hp, and 30.8 lb per hp. In 2 years, hp has climbed 18 hp and weight is actually lower by 14 lb in the composite.

**Small Car Hike** . . . Generally, the big hp increases have been in the larger cars; Chrysler, Lincoln, and Cadillac, but medium cars also brought out new engines last year with substantial hikes. The smaller cars have limited changes to revisions in present engines, but the next few years will see the biggest jump in this bracket.

What this means to the driver is a much greater torque, or ability to accelerate. Probably more important in the long run is that greater hp permits a lower rear axle ratio. This results in improved gas economy and less engine wear because of the fewer revolutions required for a given speed.

**Install It Yourself** . . . A new power steering unit that can be installed in a used car, truck or

Specify

BUMPER FACE-BAR

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## High Strength and Impact Resistance with Excellent Cold-Formability

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

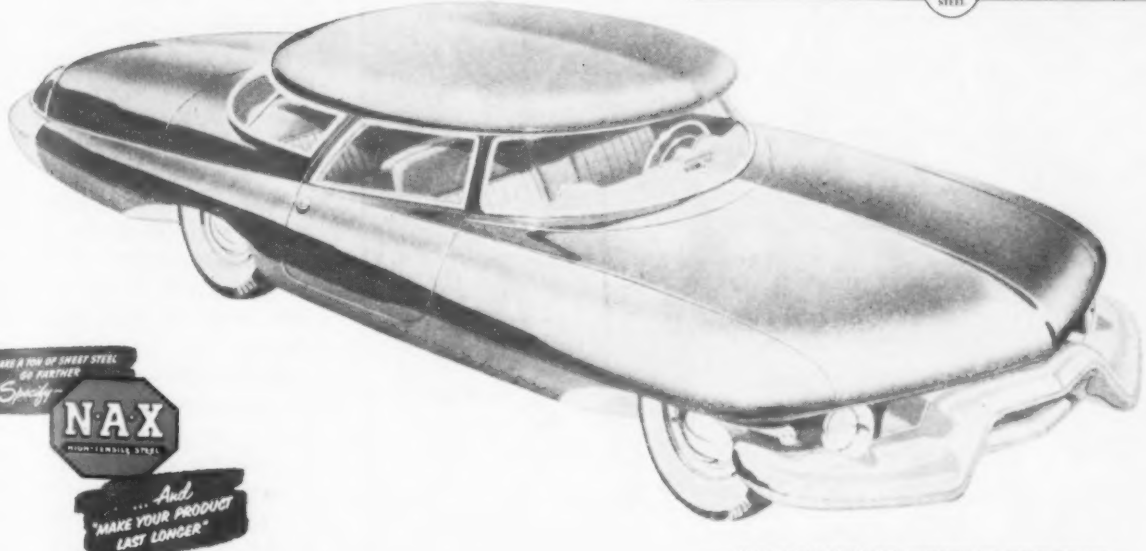
N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

**GREAT LAKES STEEL CORPORATION**

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION



KEEP YOUR SCRAP MOVING TO YOUR DEALER

tractor was introduced last week by the Monroe Auto Equipment Co.

There are several power steering units now on the market, but the Monroe unit opens up a new field for vehicle owners who have decided they like power steering after they purchased their car.

Power steering has been one of the big surprises in the auto industry. It has caught on to an extent never anticipated. The Monroe unit should find a ready market in new cars and in used cars.

**All Out by April** . . . Schedules call for full production by the end of April, according to B. D. McIntyre, president of Monroe. The unit is operated by a standard type hydraulic pump mounted on the car engine which pumps oil under pressure to the valve and cylinder contained in a single tube. The assembly replaces the drag link in conventional power steering.

The Monroe unit does not exert a constant pressure, but responds when 3 lb or more is applied to the steering wheel. This is translated to hydraulic pressure up to 750 lb.

# Powerglide:

**Chevvy plans major expansion of manufacturing facilities.**

An "extra" gaining such widespread acceptance that it is nearing the end of its optional designation is the automatic transmission.

To keep up with the demand for the Chevrolet Powerglide, a major expansion of Powerglide manufacturing facilities was announced last week by T. H. Keating, Chevrolet general manager.

It took Chevrolet 6 months to manufacture 100,000 Powerglide units when they were first introduced in 1950. That figure was reached in 3 months this year. Chevrolet produced 1,034,989 Powerglides of the original design before switching to the improved 1953 model.

### Output to Double

The new facilities will be added to the Chevrolet manufacturing plant in Cleveland where two Powerglide assembly lines are now working two shifts 6 days a week. Chevrolet employment at the plant will be increased to 2500. Production will be approximately doubled by the expansion.

On the defense production front, Chevrolet pointed to its shell production record as subtle evidence that blame for the much-talked-about ammo shortage can't be attached to its shell division at St. Louis. (See p. 55.)

Mr. Keating pointed out that the plant has already built four times as much 105 mm artillery ammunition as it turned out for World War II. The plant just produced its 11 millionth shell under its present contract as well as 650,000 forgings for other shell plants. The plant is up to schedule under its Ordnance contract.

THE BULL OF THE WOODS — By J. R. Williams

NOW THIS MACHINE IS CALLED A PLANER--NOTICE HOW DIFFERENT FROM A LATHE!
IT'S IN TH' LADIES YOU SEE HOW FAST THINGS ARE MOVIN' THESE DAYS--A FEW YEARS AGO THEY'D BE HOLDIN' THEIR SKIRTS AN' DUCKIN' DIRT, GEARS AN' DANGER, AND SEE NOTHIN'!
I'LL BET TH' FIRST THING TH' BULL NOTICED IS HOW QUICK THEY FIND THINGS TO LAY AROUND ON!
4-17
J.R.WILLIAMS
THE QUICK LEARNERS
T. M. Reg. U. S. Pat. Off. Copr. 1953 by NEA Service, Inc.

## Luxury Models Are Sales Leaders

It was obvious at the introduction of new models for 1953 that most companies and divisions were stretching upwards in the price bracket in attempts to increase their market share.

Recently Pontiac released some figures to show why the direction was up, not down, when the courses were charted.

H. E. Crawford, Pontiac general sales manager, pointed out that when the Catalina, a luxury hardtop, was introduced, expectations were that it would account for no more than 5 pct of Pontiac sales.

The Catalina surprised its makers when it hit 8 pct the first year, 12.8 in 1951 and 19.1 in 1952. Trend continued in 1953 when 19.9 pct of February output was claimed by the Catalina. Projected schedules call for an increase. Pontiac's experience has been paralleled by most other companies, particularly Buick, which makes more hardtops than any other of the automobile producers.

When 1953 schedules were laid out tentatively, it was planned to build about 12 Pontiac deluxe models for every special. In February the ratio was increased to 15 to 1 and projected schedules will hold to the ratio.

# Ike Will Decide on Military Strength

**Ends feud between Defense Secretary Wilson and military brass . . . Lead, zinc interests battle for higher tariffs . . . Sketchier Census Bureau industry statistics—By G. H. Baker.**

President Eisenhower's new policy of getting the last word on all major Pentagon decisions involving military strength signals a temporary truce in the behind-the-scenes struggle between Defense Secretary Wilson and Army and Air Force generals.

Ike has made it plain that he intends to have the final say in all military wrangles over basic mobilization plans, appropriations, and troop strength. Careful consideration of national defense needs and the need for a balanced budget, will determine his policy decisions, the White House indicates.

Army and Air Force generals had been quietly seeking ways to force a switch in Secretary Wilson's order to cut Army troop strength and to trim the Air Force civilian payroll. They're resigned now to the White House decision, are banking on Ike's military background to tip the scales at least partly in their favor.

**Battle on Tariffs . . .** Extension for 1 year of current import duties is shaping up at the Capitol as a strong possibility. But Western congressmen are planning a last-ditch battle for better protection of their mining industries.

President Eisenhower has asked for a simple 1-year extension of the Reciprocal Trade Agreements law as it now exists. The law is scheduled to expire at the end of June. Senate Majority Leader Robert A. Taft, R., O., believes most Republicans will line up with Democrats in supporting extension.

**Seek Fewer Imports . . .** Western lead and zinc interests want high duties as a means of slowing imports of foreign metals produced at relatively low costs. Specifically, they are seeking assurance from both the Congress and the White House that higher rates will be ordered to protect domestic lead, zinc, and wool producers.

If this course is not feasible, they say, then Congress should give the Tariff Commission authority to raise the low rates.

**Sketchier Statistics . . .** Prospects of a sketchier business information from the U. S. Census Bureau confront the nation's manufacturing and mineral industries. Tentative budget reductions voted by the House Appropriations Committee trim future outlays for compilation of this type of information from $21 million to $11.5 million.

Even deeper cuts may be voted when the huge Commerce Dept. appropriation bill reaches the House floor, but the Senate is talking unofficially about restoring some of the deleted funds. Affected are censuses covering the manufacturing, mineral, and transportation industries.

**Cut Down Deadheads . . .** Eisenhower economy moves are beginning to produce tangible results. New Civil Service figures show that the Administration lopped 7800 workers from federal payrolls during its first month in office, thus bringing the total number of government employees in the Washington area to the lowest point in 2 years.

This trimming does not reflect the dismantling of controls agencies. Folding of price and wage control boards, plus paring down of National Production Authority, is expected to result in even heavier reductions in the weeks ahead.

**"Out of Business" . . .** Promises by the Eisenhower Administration to "get the government out of business" are backed up again this week with action as the White House studies new and concrete proposals for selling the Federal Government's multi-million dollar synthetic rubber industry.

Reconstruction Finance Corp., operator of the 11-year-old wartime industry, says the time has come for synthetic rubber to stand on its own feet in today's competitive market. The agency has submitted to Congress a lengthy engineering report recommending sale of all synthetic facilities.

**Salvage $350 Million . . .** Built up from scratch early in World War II when the tide of war cut the U. S. off from all but a fraction of its natural rubber sources, the sprawling synthetic industry today includes 28 different plants and a research laboratory.

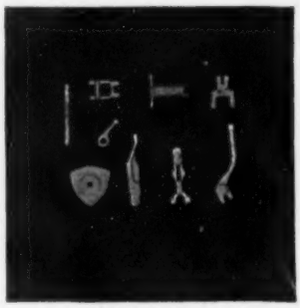
Total annual capacities: 860,000 long tons of general purpose rubber (GR-S) and 90,000 long tons of butyl rubber (GR-I). While RFC is reluctant to predict what selling price will result from negotiated bidding for the plants, Congressional sources say unofficially that the government probably will recapture about $350 million of its $500 million investment.

# Accumet Precision Castings

## *for all industrial uses*

With Accumet Precision Castings, Crucible has developed a process of producing precision investment castings in intricate designs with the smooth, satiny finish and closely-held dimensions characteristic of "lost wax" castings. Casting tolerances start at plus or minus 0.005" although under certain circumstances closer tolerances can be held. This relatively new metal forming process solves many difficult problems in design, tooling and production of metal components.

### *fuel injectors from precision castings*



Fuel injectors and carburetors for aircraft are mechanisms containing a variety of peculiarly shaped component parts. The usual procedure is to use hardenable, chrome stainless steels, Types 416 and 440F, which are most adaptable to easy machining. However, to save costs in machining from bars, stocks and forgings, Crucible applied Accumet Precision Castings. The close size control and good surface finish of the castings eliminate many costly machining operations — saving manpower, machine time and tooling expense.

### *more information available on castings*

Long a leader in the development of precision investment castings, Crucible offers you the services of an alert metallurgical staff to help you profitably apply these specialty steels to your operation. Write us for more detailed information. CRUCIBLE STEEL COMPANY OF AMERICA, General Sales and Operating Offices, Oliver Building, P. O. Box 88, Pittsburgh 30, Pennsylvania.

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# STANDBYS: Senate Debate Looms

**White House power on wage-price-rent freeze to draw heavy fire . . . Bill would authorize credit curbs, allocations, SDPA extension, loans in emergency—By *R. M. Stroupe.***

Two targets are being marked for sharp debate when the Senate begins floor discussions of S. 1081, a bill to provide temporary economic controls and continue federal authority in defense production.

Heavy going is expected for the section allowing the President to hold prices, wages, and rents immobile for 90 days for purposes of security and economic balance at the beginning of a "grave national emergency." Similarly, opponents of rent control have announced they will put up a fight against extension of ceilings, with slight permissible increases, through Sept. 30.

Standby authority for the President to invoke a price-wage-rent freeze is a fundamental part of S. 1081, sponsored by Sen. Homer E. Capehart, R., Ind., and approved last week by the Senate Banking Committee, which he heads. The Chief Executive would be empowered to exempt from his order any materials or services which he feels would be needless or detrimental to control for crisis purposes.

### Could Split Dates

Date of the freeze order would be left to the president's discretion. Moreover, in announcing the order he could name separate effective dates for prices, wages, and rents.

Other important features of the bill are:

1. Federal Reserve Board would have authority, at any time before Apr. 30, 1955, to reimpose controls on consumer and mortgage credit curbs. FRB chairman William M. Martin told the Capehart committee recently that his agency would not put credit limitations in effect now if it had such power.

2. Government priority and allocation authority over scarce and critical materials used in defense programs would be continued until June 30, 1955. This extension was specifically requested by the Administration.

3. Small Defense Plants Administration, or any successor agency, would get another 2 years of life.

4. Loan program to encourage exploration for and mining of strategic metals and minerals would go on for an additional 2 years.

### Predicts Senate Passage

In general, the Banking Committee reported the kind of bill forecast by Sen. Capehart. It approved the 90-day-freeze section by a 12-3 vote and gave its chairman a serious tussle only on the issue of rent control. Sen. Capehart has predicted the Senate will pass the bill.

Amendments or deletions may be required before the senior lawmakers clear the measure. As majority leader, Sen. Robert A. Taft, R., Ohio, could do much to open the way for passage. He personally is not in favor of standby controls, but as the man who has piloted Administration measures in the past 2 months he may work for S. 1081.

Best indications are that in altered form the bill will get Senate approval and be sent to the House, where the Banking and Currency Committee will examine it.

Chairman Jesse P. Wolcott, R., Mich., thinks Congress will act quickly enough when a real emergency arises, without controls legislation on the books. For this reason, he may state serious objections to current wording of the measure.

Conceivably, the Wolcott committee could find enough flaws in the new controls bill to give the Administration cause for worry. If certain passages appear completely unacceptable, chances are good that a group of conferees from both Houses eventually will be named to produce a compromise measure.

# Labor Law:

**Hear many Taft-Hartley ideas . . . Firm program still distant.**

Advice on rewriting the Taft-Hartley labor law appears daily, but a concrete program is still a long way off.

As one industry representative put it, "It is seldom that Congress has undertaken a major legislative task with less of an idea of what it wanted to do."

### Stay Out Of Disputes

Last week, U. S. Steel Corp. vice-president John A. Stephens urged the Senate committee to make the 80-day anti-strike injunction mandatory in national emergency cases.

Joseph E. Moody, president, Southern Coal Producers Assn., wants government investigation and control, where necessary, of union welfare and pension plans. He told Congress to forget basic amendments until the law has had a better chance.

Robert D. Blasier, Westinghouse Electric Corp. vice-president, would have an independent government agency set up with sweeping powers to outlaw unions that knowingly keep Communists at the helm.

CIO president Walter Reuther, urges Congress take upon itself the responsibility for dealing with national emergency strikes. He opposes the 80-day injunction against strikes involving the nation's health and safety. Instead, he says, Congress should provide a tailor-made formula in advance. He argues that this would remove much of the uncertainty usually found at industry-wide bargaining.

"Buffalo" Tips on Metal Bending

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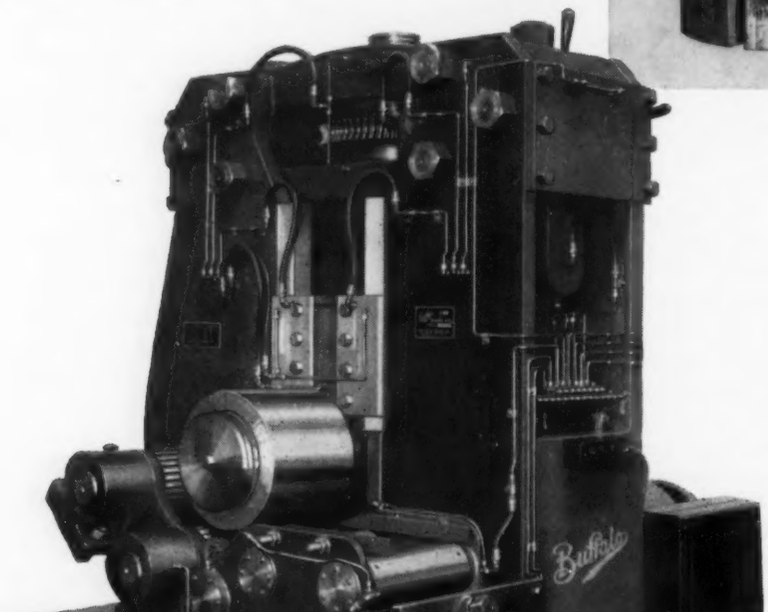

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Here's single-pass cold wrapping at a profitable rate of speed! The No. 3 Wrapping Roll shown features pneumatic foot control, horizontal material feed, easy roll changes, quick release of finished work (no outboard bearing on mandrel). Permits high production. Rolls and shafts are alloy steel; frame and base are all-welded steel for extreme rigidity and strength. If you're planning to make a circular or cylindrical product, there's no lower cost method than with a "Buffalo" Wrapping Roll. *Write for Bulletin 3150 for all data.*

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

# Ready Scrap Shipment to Japan

**Los Angeles firm prepares 8000 tons for first known post-war shipment to Japan . . . Shipbreaking probably included in deal . . . Dealers push for export licenses—By T. M. Rohan.**

Decks were being cleared last week for the first known shipment of scrap to Japan from the West since before World War II.

U. S. Dept. of Commerce Office of International Trade in Washington, in keeping with their trade policy, has refused to confirm granting of an export license, but preparations are under way at National Metal and Steel Corp. on Terminal Island in Los Angeles Harbor for loading high grade scrap for shipment to Japan. Disclosure will probably bring a rash of "me too" applications from western dealers seeking a new market.

**Scrap Ship Too** . . . Tonnage allowed under the license was 8000. This will probably include the weight of the ship used to transport it, which would also be cut up for scrap. World War II Liberty ships are especially suited for this.

"Hardship" permits have been granted in recent months for shipment to Mexico and Canada, but this would be the first to a distant country.

Permits were granted for 41,315 tons in the last quarter of 1952 and tonnage for the first quarter this year was about the same. Only major shipment in the West under this type permit was 6000 tons shipped in February by Learned Co. of Oakland to eastern Canada by low-cost foreign bottom.

**Agitate for Licenses** . . . At the last meeting of the Institute of Scrap Iron & Steel, western scrap men sponsored a petition to the national group to seek licenses. But this was given doubtful chance of success due to ceiling price conditions generally prevailing at the time.

There has since been considerable unofficial agitation by dealers for licenses, but this has been interpreted primarily as a method of promoting scare buying by mills.

Western scrap prices have steadily declined in recent months due to continued mill inventory build-up during the strike, then concentration on use of top grades for higher steel output. And an early warm spell in California brought out a flood of collectors.

**No Takers** . . . Official comment at National Metals was unavailable, but negotiations with dock workers on a penalty rate for dangerous cargo were believed to be holding up loading.

The license also reportedly covered shipment of an unspecified tonnage to Japan from Guam where Armed Forces scrap is readily obtainable. Tonnages from Guam and the Mariania Islands, U. S. trust territory, have been offered West Coast mills, but generally refused due to price and plentiful local supply.

**Selling Out** . . . Pacific Electric Mfg. Co. of San Francisco (THE IRON AGE, Mar. 19, p. 79), leading western high voltage circuit breaker manufacturer, will be sold shortly.

Federal Electric Products Co. of Newark, N. J., a major low voltage switching equipment manufacturer, has an option to buy 98 pct of Pacific Electric's stock for $4.5 million. Securities and Exchange Commission purchase approval is expected shortly.

Jos. Thompson, founder, president and majority stockholder (THE IRON AGE, Dec. 4, 1952, p. 149) for the past 47 years, and other management will continue, but nationwide sales facilities of the two firms will probably be merged, permitting unified bidding.

**Spring Brings Luck** . . . Crying need for more western oil to relieve the strain on California wells got a break last week. Warm spring weather gave the Trans Mountain Oil Pipe Line Co. of Vancouver, B. C., an early start on the construction of the 718-mile, $92-million pipeline (THE IRON AGE, Sept. 18, 1952, p. 98) from Edmonton to Vancouver, now scheduled for August completion.

In all, there are 389 miles of 24-in. pipe, almost all from Consolidation Western (U. S. Steel) and Kaiser, to be laid this year.

**More to Come** . . . Initial pipeline capacity will be 120,000 bbl daily when the first oil reaches Vancouver in October. This will be increased to 150,000 bbl in July 1954 by addition of a fourth pumping station.

Refinery capacity at Vancouver has been boosted to 120,000 bbl per day, and several major refineries are currently being engineered for the northern Washington area.

In 1954, a spur line will be built to the Ferndale, Wash., refinery of General Petroleum and others now contemplated for the area.

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## Rugged Construction of CATERPILLAR Equipment Calls for Versatile, Dependable H-P-Ms!

Production men at Caterpillar Tractor Company find versatile H-P-M All-Hydraulic presses perform a wide variety of jobs in building Caterpillar's extensive line of tractors, engines, motor graders and rugged earth-moving equipment. There are 6 H-P-Ms in this diversified production line, ranging in size from 500 to 3500 tons . . . and, one press may do work on as many as 15 or 20 different parts.

If pressure processing plays a part in your production, it will pay you well to talk shop with an H-P-M engineer. Write today!

HPM **THE HYDRAULIC PRESS MFG. CO.**

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Presses for Every Pressure Processing Application

# Must Cater to Civilian Replacement Need

**Civilian market focus of NMTBA meeting . . . Replacement demand will be high if builders sell effectively . . . Toolmakers told not to rely too much on Vance plan—*By E. C. Beaudet.***

The defense program, renegotiation, government buying policies, interim controls and other pertinent topics received top billing at the spring meeting of the National Machine Tool Builders' Assn. in New York City last week. But the subject that seemed uppermost in the minds of attending members was the civilian machine tool buyer.

The civilian buyer is once more returning into the driver's seat. For some companies he's already there. For others he's expected shortly. It was with the civilian buyer in mind that many of the topics above were discussed.

**Depend on Replacements** . . . The market upon which the machine tool industry must depend and concentrate is the replacement market, primarily among civilian goods manufacturers, according to Swan Bergstrom, president of the association.

He pointed out that if the present Administration in Washington fulfills its promise of encouraging free enterprise there may be a wave of intense competition such as this country has not seen in years. New products will be introduced, old ones redesigned and the entire market structure of the country will be broadened.

**Must Show Them** . . . An urgent effort on the part of manufacturers to increase the quality and reduce the cost of their products will result in more plant modernizations and increased replacement demand, provided the machine tool industry is ready to show these manufacturers what new machine tools can do to cut their costs.

The growing importance of the civilian market is evidenced by the fact that rated orders at present constitute only 50 pct of the industry's backlog. As this figure falls lower, it will be up to the machine tool builders to take up the slack with more aggressive selling.

**Don't Count on It** . . . Builders were cautioned against placing too much reliance on the Vance Committee report as a guarantee of business for the machine tool industry. The Vance Committee report recommends the building up of the nation's defense capacity to produce military goods rather than production and stockpiling of military end items.

Mr. Bergstrom pointed out that the plan must first be considered by the various branches of the Armed Forces. If acceptable its adoption would still require Congressional approval.

**May Slow Orders** . . . Even if the plan should be eventually adopted, the volume of annual machine tool purchases contemplated at present would only represent a fraction of the industry's capacity to produce. In the meantime, this may have the effect of slowing down current defense buying pending further consideration of the Vance plan.

This subject was delved into more deeply by Ralph Howe, chairman of the association's subcommittee on permanent defense capacity. The Vance report, he stated, gives three sources and an estimate of the amount of business the industry might expect from these sources during the next several years.

**Estimate Is Accurate** . . . The first source is normal commercial business which is estimated to run about $300 million per year. This would seem to be a reasonable estimate, Mr. Howe said.

The second source would provide anywhere from $200 to $500 million for the purchase of additional production equipment to build up the nation's defense capacity. It was estimated another $300 million would be spent for modernizing and maintaining this defense capacity.

**Figure Not Reliable** . . . Of these three sources, Mr. Howe said the $300 million for maintenance and replacement is purely in the realm of conjecture and cannot be relied upon.

Disregarding this figure, the industry can look forward to at least $500 or $600 million of new business in the next year or two, he said. This is about half of the industry's current operating rate.

In view of these facts the industry must take the initiative in increasing sales, redesigning products to meet consumers' needs and improving services to the customer.

**Words of Caution** . . . M. A. Hollengreen, chairman of the government relations committee, cautioned builders against the tendency to divert rated orders and against taking advantage of pool contracts. Such actions if they became widespread would be detrimental to the whole industry, he said.

Yes, gentlemen, *less* than 5% ripple—and you know that means more uniform deposits. This exclusive new H-VW-M Rectifier also has dual input for either 220 or 440 volts. That's right, single knob control instead of several—but that single knob controls 22 points of on-load switching!

And that *oversize transformer* is another typical H-VW-M "extra"—operates continuously without exceeding a 25°C. temperature rise . . . *plenty of reserve capacity*. The acid and alkali-resistant coating on both the transformer and the selenium stacks is real assurance of dependable, long life. There's *increased plate area*, too—and easily replaceable Fiberglass dust-blocks to filter incoming air. And instead of an ordinary contactor, there's a standard starter to guarantee AC line-overload protection with no-voltage release.

These Rectifiers—*made* by H-VW-M—have a smooth, easy-to-clean, durable, grey, hammer-tone finish and are the most complete line in the industry. They're available with either self-contained or remote control, in a full range of sizes from 50 to 10,000 ampere units in all desired voltages. And by comparison, *they cost less per unit than any other rectifiers made!*

Superior, lower-cost rectifiers are just one of the many results of H-VW-M's constant progress in electroplating and polishing development for more than eighty years. It's a continuous policy, best summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer—not only in rectifiers—but in every phase of plating and polishing.

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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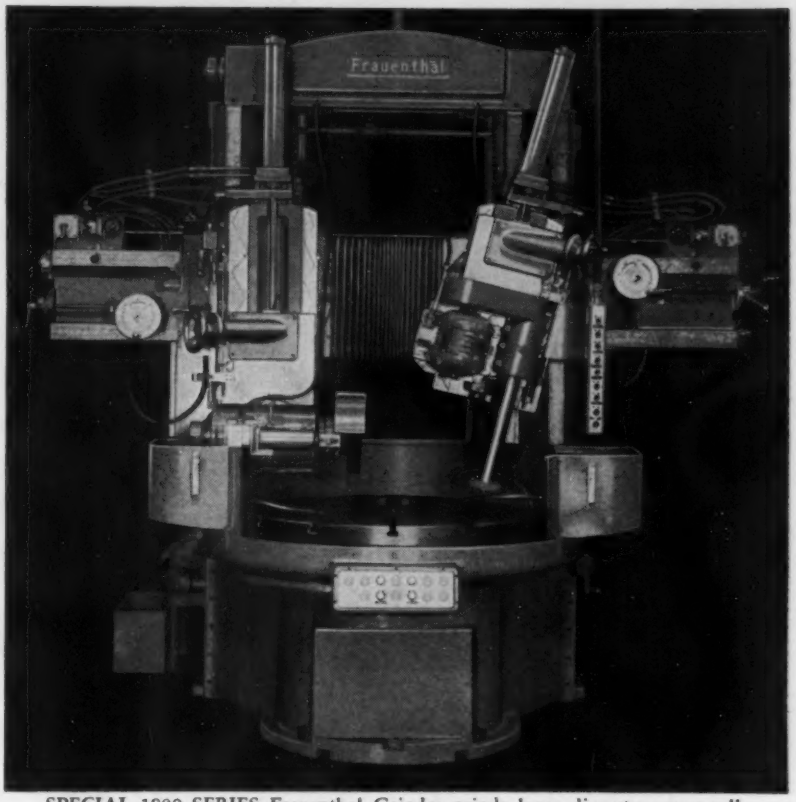
**PROBLEM:** To assure *related* high-precision uniformity between tapered bores or diameters and flat surfaces.

**SOLUTION:** Special features were engineered into this Frauenthal Grinder, with one direct-connected spindle (at left) and one cartridge-type spindle (at right) for simultaneous grinding. Photo shows right-hand spindle compound swiveled about 10 degrees off vertical for grinding a tapered bore, while left-hand compound has its motor base swiveled 90 degrees, with axis of grinding spindle parallel to face of table for grinding surface with periphery of wheel.

**ACHIEVEMENT:** Vital precision (parallelism and concentricity within 200 millionths of an inch!); perfect interchangeability of parts; less production and inspection time; lower costs, greater output!




SPECIAL 1800 SERIES Frauenthal Grinder grinds large diameters or small (1-inch diameter) holes simultaneously, to MILLIONTHS of an inch tolerance!

## Great grinding range . . . special high-rail clearance for wide variety of precision work:

Astounding adaptability permits Frauenthal Grinders to do many heretofore "impossible" jobs. For miscellaneous work, unique features of this Special 1800 Series Grinder include: Cartridge spindle (right) with 16″ extended quill, 30″ overall clearance, speeds up to 10,000 RPM; Direct-connected spindle (left) with two-speed 1800/3600 RPM; pendant-type control for work table and grinding spindles; 180-degree pendant-swing; safety switch (cuts out all power at once) . . . and other features you'll find profitable.

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MULTIPLE-HEAD SUPER-PRECISION CYLINDRICAL **Grinders**
PRECISION-GRIND INSIDE, OUTSIDE AND FACES SIMULTANEOUSLY TO MILLIONTHS OF AN INCH!

*Similar special features can be engineered into standard Frauenthal Grinders for your specific needs.*

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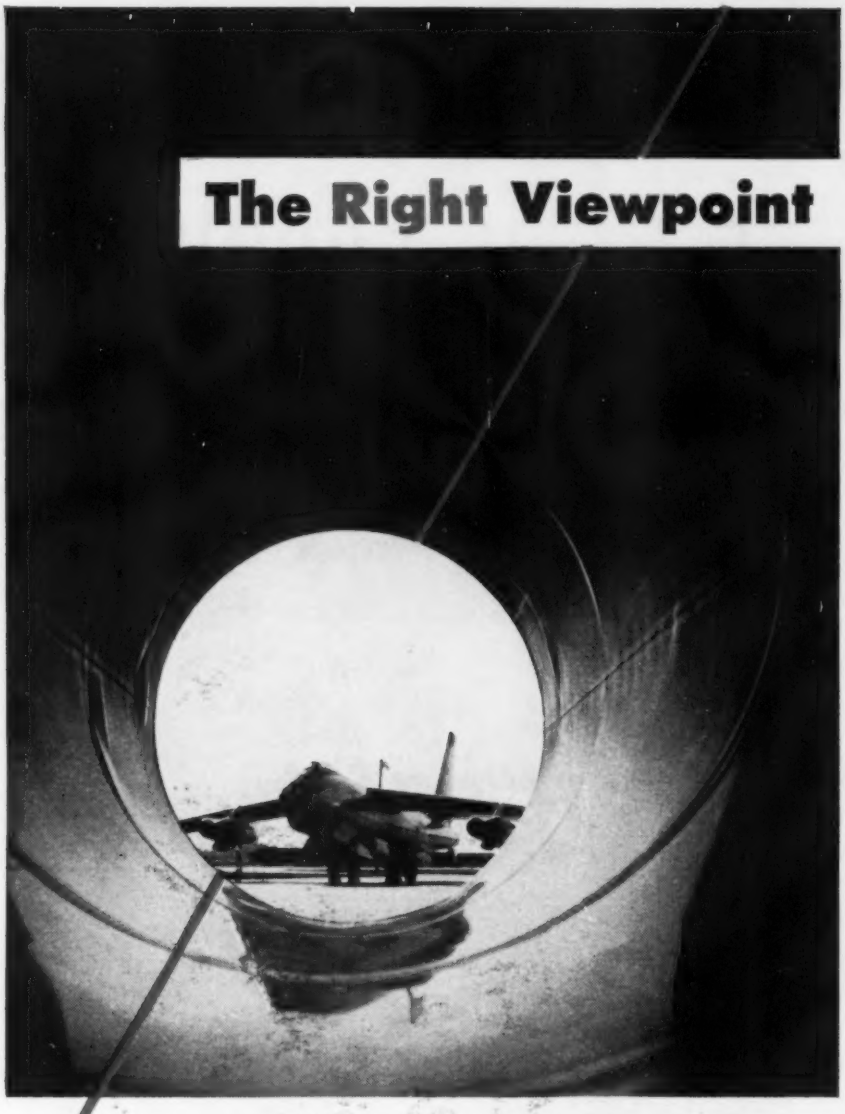


When you're thinking about aluminum or magnesium castings, you need the services of an organization with the right viewpoint.

We're referring, of course, to the right viewpoint toward the best possible use of these two light metals . . . ability to do the job; . . . service; . . . adequate facilities for production; . . . experience.

We here at Wellman like to think we have a combination of all these things . . . trained, interested personnel, three complete foundries and a modern pattern shop, almost a half century of experience in solving casting problems.

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## —Free Publications—

*Continued*

### Jig borers

Pratt & Whitney has issued a new bulletin on its Model 2E Electrolimit Jig Borer. Patterned after the 1E and 4E Jig Borers, the 2E is intermediate in capacity and is designed for a wide variety of small to medium-sized jobs. A diagrammatic illustration is included to show how the P & W Electrolimit Measuring System operates. This system is said to provide a fast, accurate method of locating the table. *Pratt & Whitney.*

For free copy circle No. 14 on postcard, p. 87.

### Insulation

*Quinterra-Quinorgo* is a 32-p. publication covering Johns-Manville electrical insulations made from purified asbestos. Included are tables giving test data on physical and electrical properties and a step-by-step photographic sequence showing application techniques. *Johns-Manville.*

For free copy circle No. 15 on postcard, p. 87.

### Steel bolting

Taylor Forge & Pipe Works has reprinted a technical paper on steel bolting for piping and pressure vessels. The talk was given at the annual American Society of Mechanical Engineers meeting last year. Comments on each ASTM specification are given, and there are tables on the compilation of properties and bolting selection. *Taylor Forge & Pipe Works.*

For free copy circle No. 16 on postcard, p. 87.

### More than pumps

The name Worthington is usually associated with pumps, but the company has put out a new booklet to stress the fact that in addition to pumps it also makes a wide variety of other machinery. Among the types of machinery discussed are: Diesel engines, compressors, air conditioning and refrigeration units, steam turbines and condensers. *Worthington Corp.*

For free copy circle No. 17 on postcard, p. 87.

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IF you have a B&D Tool that's not performing up to par, give it back the power, speed and accuracy with which it left the factory—with a fast, expert, economical repair job at the Black & Decker Service Branch nearest you!

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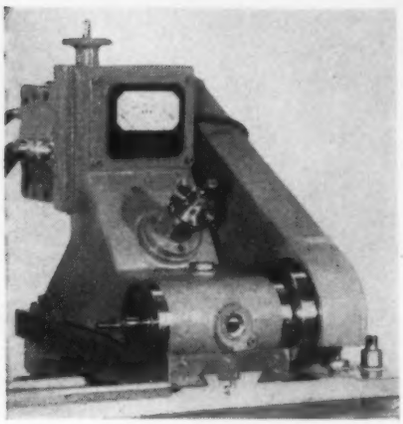
# NEW EQUIPMENT

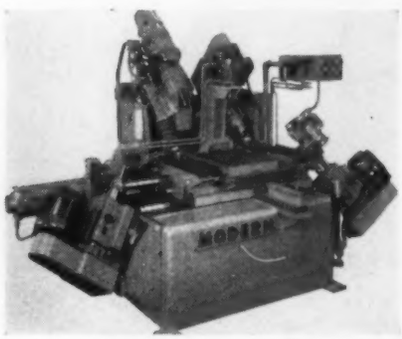
**New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 87 or 88.**



## Reduced production costs, increased cutter life

New operating principles embodied in the design of a group of hydraulic thread milling machines are said to reduce production costs by one-half, increase cutter life three times, and improve the finishes even on materials known to be difficult to machine. Speeds are infinitely variable up to 3000 rpm. Application of adjustable speed hydraulic motors to the cutter spindle drive and the work spindle drive permits a balancing of cutter speed and work feed, producing the best cutting condition for the material involved and permitting the use of carbide cutters where applicable. Adjustments are instantly possible during the operating cycle. All actions are automatic except the handling of workpieces. Lead cam and cross feed cams are interchangeable. *Hanson-Whitney Co.*

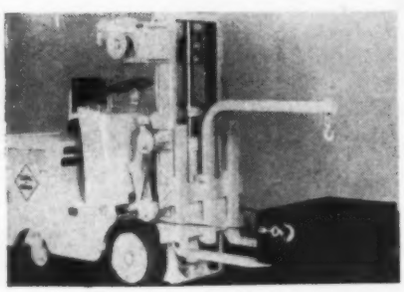
For more data circle No. 18 on postcard, p. 87.



## 55 cylinder blocks at 80 pct efficiency

Three holes are drilled at compound angles and one tapped in this four-way machine for production of automotive engine cylinder blocks. It drills oil holes from the camshaft main bearings to the oil gallery hole; drills and taps a hole in the pan rail on one side of the block. As cylinder blocks approach the machine on a roller conveyer, they are transferred to a fixture which is shuttled into position for the drilling and tapping operations. Standard component parts are used throughout the machine to reduce costs and maintenance expense. A coolant system is provided for the tapping operation. *Modern Industrial Engineering Co.*

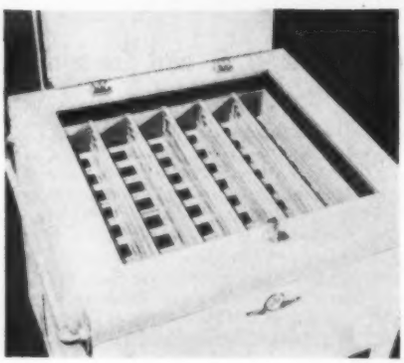
For more data circle No. 19 on postcard, p. 87.



## Fork truck eliminates die handling problems

Designed for placing and removing dies from presses, a multi-purpose fork truck is equipped with forks, a boom, and die-pulling equipment. The 4000-lb capacity truck has 42-in. long forks and a 42-in. boom, the latter used when dies can not be easily handled with the die-pulling device. The die-puller is operated by a separate electric motor and controlled by a master switch. Sheaves on uprights serve as guides for die-pulling cable and permit straight pull at two positions. *Elwell-Parker Electric Co.*

For more data circle No. 20 on postcard, p. 87.



## Portable rivet cooler is self-contained

A refrigerator for aluminum rivet storage is completely self-contained, utilizing a ½ hp condensing unit. A thermostat controls temperatures from 100°F in less than 3 hr to 48 lb of aluminum rivets, the capacity of the unit. Forty-eight individual rivet canisters and 6 canister racks store the rivets centrally in the refrigerated storage compartment. The refrigeration system is automatic in operation and will maintain a rivet temperature as low as 30°F if desired. Refrigeration system is charged with 5 lb of Freon 12. Unit is 40¾ in. high x 38⅝ in. long x 35½ in. wide. *Ace Cabinet Corp.*

For more data circle No. 21 on postcard, p. 87.

*Turn Page*

# How Oxygen...and LINDE SERVICE*

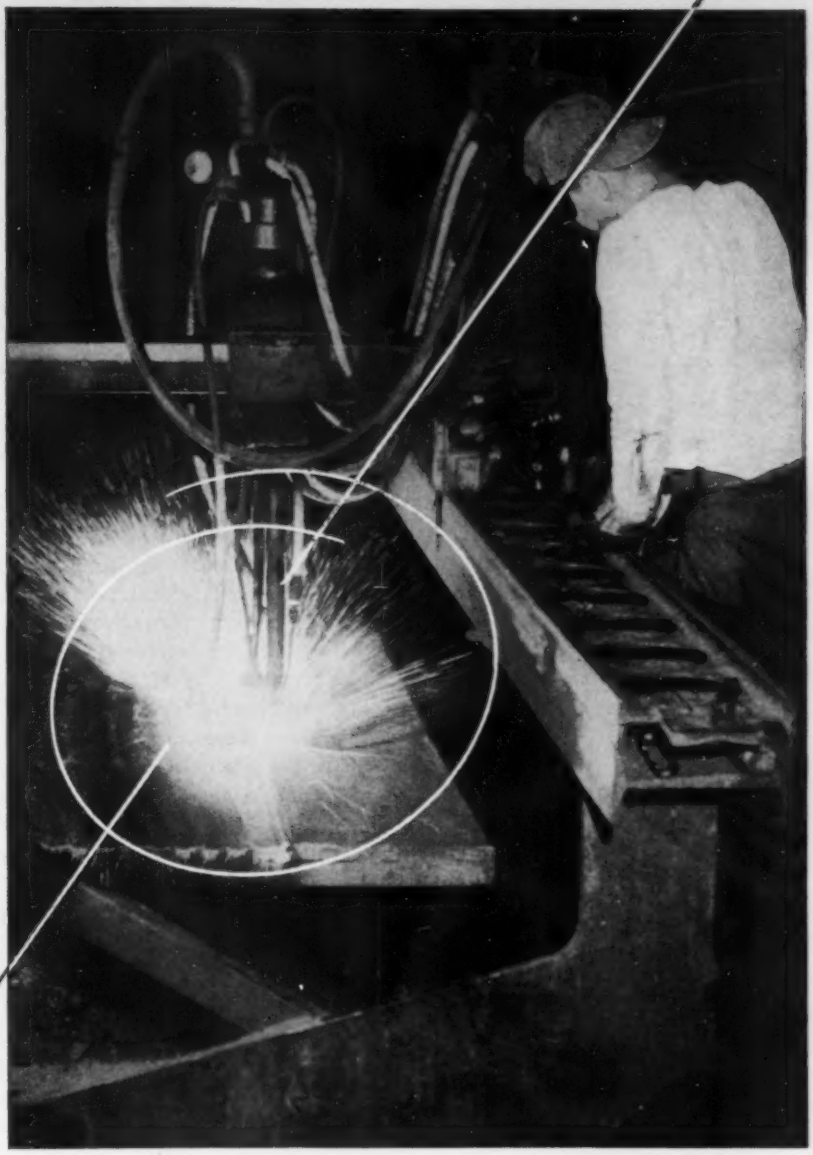
# SAVED $700,000

## FOR ONE STEEL COMPANY

"Burning the unburnable" was the problem that faced producers of stainless steel. This steel resisted scarfing and cutting—even with the intense heat of the oxy-acetylene flame.

Doing this work by mechanical methods meant sky-high costs. But that looked like the only answer—until LINDE SERVICE took a hand with the problem.

Working in the laboratory and in the field, LINDE engineers developed powder cutting and scarfing. By adding powdered metal to the oxygen flame, stainless steel was scarfed and cut with ease and speed.



**LINDE SERVICE IN ACTION!** Powder cutting is saving this company alone over $700,000 per year in the production of stainless steel. And they're making a better product.

This is but one example of how LINDE customers are saving millions of dollars each year through LINDE SERVICE. If you use oxygen, let us tell you how LINDE SERVICE can save you time and money, too.

* **LINDE SERVICE** is the unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

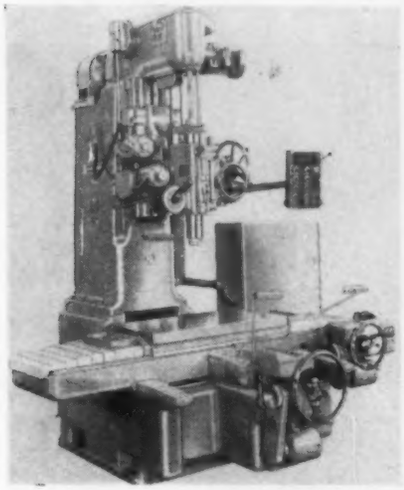
Linde Trade-Mark

**LINDE AIR PRODUCTS COMPANY**

*A Division of* UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N. Y.

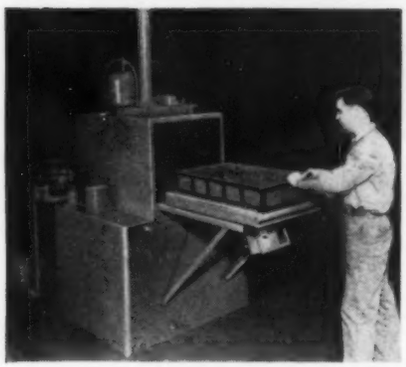
*In Canada:* Dominion Oxygen Company, Limited, Toronto



## Measuring system incorporated in jig borer

Featuring the Electrolimit measuring system and the preloaded ball roll quill, the No. 2E jig borer is capable of locating and machining to tenths. Two separate Electrolimit measuring units, one for longitudinal and the other for transverse movements, are independent of transversing screws. The precision preloaded ball roll quill roll-feeds on 288 precision balls, is hardened, precision ground and draw lapped for extreme accuracy. Electronically controlled milling feeds are infinitely variable from 1 to 15 ipm. Rapid power travel of 60 ipm is also provided. Eight selective spindle feeds range from 0.0005 to 0.015 ipr, both up and down. Twelve spindle speeds range from 37 to 1800 rpm through a gear box and four speed motor. Work table is 22 x 44 in.; travel is 36 in. longitudinally and 22 in. transversely. Maximum height between table and spindle end is 27 in. Special columns can increase machine height. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For more data circle No. 22 on postcard, p. 87.



## Automatic washers speed metal cleaning

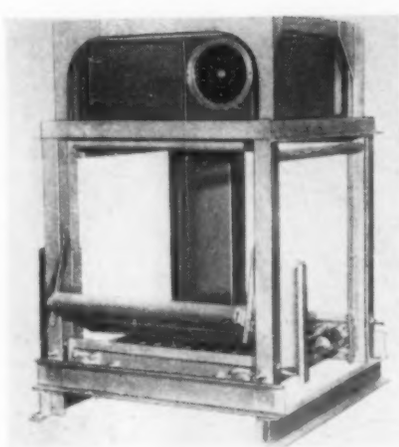
Forced circulation washers in three different sizes are designed to speed metal cleaning through automatic cycling and by combining washing and rinsing in a single operation. The single-stage unit completely eliminates secondary washing and extra work handling operations by employing an automatic surface spray skim-off. When used with recommended detergent metallurgically clean results are said to be 50 pct faster than ordinary washing methods. For average load conditions total cycle of 5 to 7 minutes is sufficient to thoroughly clean workpieces. Solution temperatures, work handling, and cycles for solution circulation and skim-off are controlled automatically. *Ipsen Industries, Inc.*

For more data circle No. 23 on postcard, p. 87.

## Molding sand moisture tested continuously

Tradenamed Waterteller, a continuous electrical moisture determination machine takes a continuous flowing sample of core or molding sand from a conveyer or mill. A stream of riddled sand falls on a rubber-faced rotating disk. The sand is struck off to a constant volume and then rammed by a roller to a predetermined hardness. This controlled ribbon of sand is subjected to a high potential voltage and the current flows through the ribbon of sand. The higher the moisture content, the greater the distance the electrical current will flow. The moisture content is thus expressed in distance over a well expanded scale. An electrical circuit controls water flow into sand mill. *Harry W. Dietert Co.*

For more data circle No. 24 on postcard, p. 87.



## Scale detects and rejects off-weight packages

New checkweight scale automatically indicates the weight of filled containers such as bags, drums and cartons and then separates the off-weight containers from properly filled packages by utilizing a two-way conveyer belt. Independently adjustable tolerance settings establish overweight and underweight limits. The equipment is essentially an enclosed electro-mechanical weighing mechanism and a motor driven conveyer belt. The belt on which the containers are conveyed is made of rigidly supported, heavy cadmium plated steel slats and hangs from the scale to allow free passage of the packages. A dial indicator located on the scale shows the amount of over or underweight. Additional indicators may be installed at remote control stations. For added control, a horn sounds as each offweight package is discharged. *Thayer Scale & Engineering Corp.*

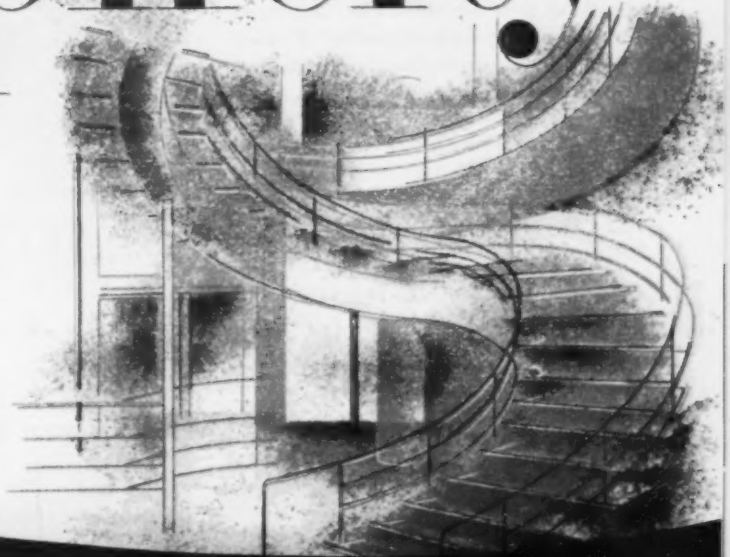
For more data circle No. 25 on postcard, p. 87.
*Turn Page*

*"Reader, if thou seekest his monument, look around"* INSCRIPTION ON SIR CHRISTOPHER WREN'S TOMB IN ST. PAUL'S CATHEDRAL

From the ashes of the Great Fire in 1666 emerged Sir Christopher Wren's masterpiece—St. Paul's Cathedral—with its soaring central dome "rising from the mists of London, like an Alpine peak". ★ In designing the dome, Wren solved with amazing simplicity one of the most difficult structural problems in architecture—how to support a great central dome without using excessively heavy and constricting crossing piers. ★ This same simplicity, combined with unusual structural engineering knowledge, enabled Wren to produce diverse effects in his many buildings without expensive elaboration.

# simplicity

Whether hidden from sight doing a functional job, or exposed to view just looking pretty, Van Huffel metal shapes and tubing simplify a lot of today's building problems. ★ Architects, designers and engineers know they can incorporate in their designs strength without excessive weight . . . economy without sacrificing quality . . . and simplicity without complicated assembly. That's why they are continually thinking up new uses. That, too, is why they keep coming to Van Huffel —where ideas take shape—in metal.



LDED • LOCK SEAM • OPEN SEAM • BUTTED TUBING
• METAL SHAPES • MOULDINGS

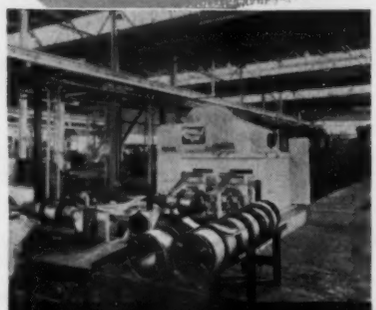
# Van Huffel

TUBE CORPORATION • WARREN, OHIO

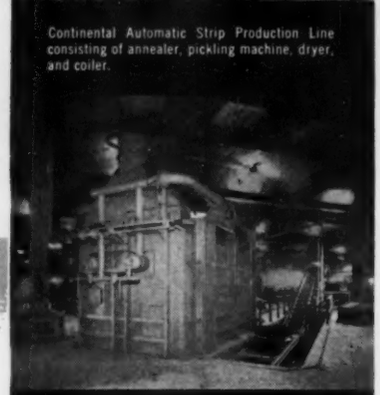
# The over-all job in

## Production Lines and Special Automatic Machines *by* CONTINENTAL

*for military production...*

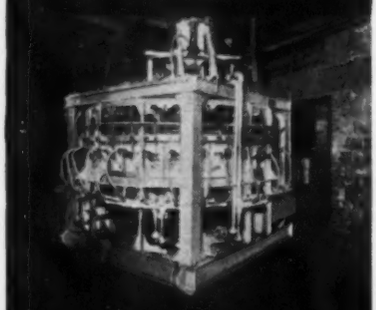


Continental Automatic Strip Production Line consisting of annealer, pickling machine, dryer, and coiler.



Continental Special Automatic Pig Molding Machine complete with automatic charging, melting, and pouring.

Continental Automatic Production Line operating from raw materials to completely finished and packed product. This production line consists of fifteen integrated, synchronized, special automatic machines.



Continental Special Automatic Glazing Machine complete with automatic press synchronizer and fire polisher.

For maximum production of military items manual operations must be eliminated. With CONTINENTAL Special Automatic Machines and Integrated Production Lines production goes on in a continuous flow with better, more uniform products with a minimum of man hours.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and the installation of the machines—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

**CONTINENTAL INDUSTRIAL ENGINEERS, INC.**
**176 W. Adams Street, Chicago 3, Illinois**
*District Representives:*
Ridgewood, N. J. • St. Louis • Cincinnati • Detroit
Milwaukee • Indianapolis • Cleveland • Pittsburgh

**PLANNED MILITARY PRODUCTION. Write for Booklet No. 127.**

FURNACES
PRODUCTION LINES

CONTINENTAL

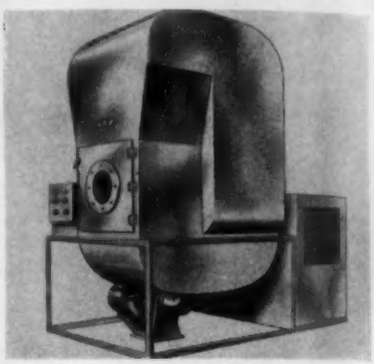
SPECIAL MACHINES
COMPLETE PLANTS

MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY




## Sand-dust testing

Sand and dust environmental testing is possible with a new unit that is engineered on concepts of streamlined air flow. These have made it possible to lower the power necessary to move the air and reduce the floor space required while at the same time minimizing air

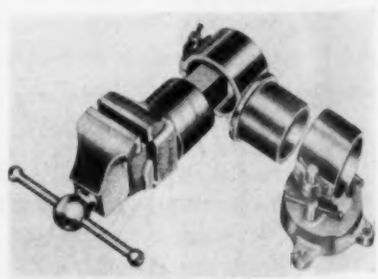


side pressure drop. Another feature of the equipment is automatic temperature and dust density control which permits test to be set up for long term runs without constant manual regulation. Air velocity is maintained constantly throughout the run at the pre-set speed. *American Research Corp.*

**For more data circle No. 26 on postcard, p. 87.**

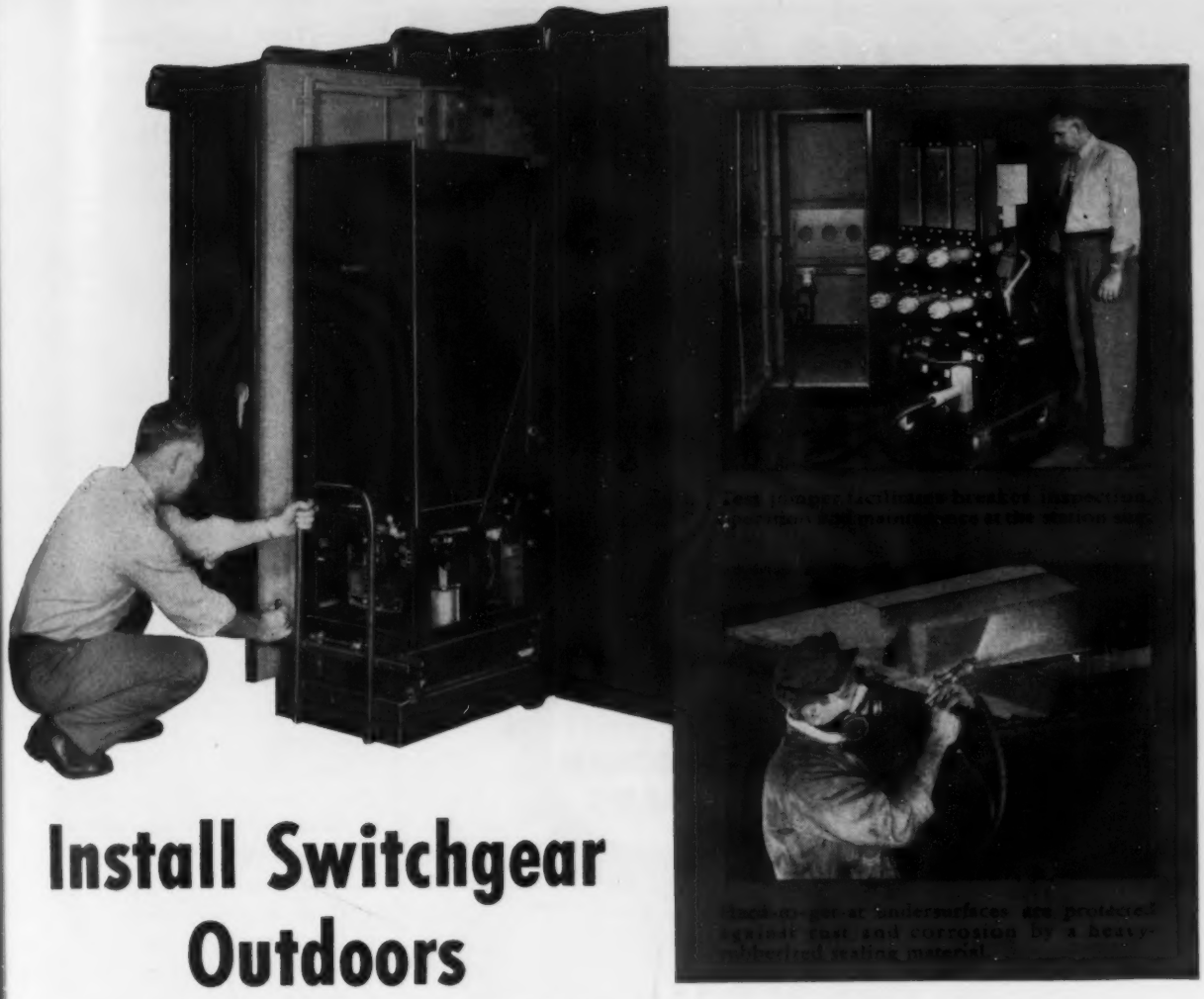
## Rotating vise

Complete rotation of 360° in any direction is provided by a new machinists' vise. Three adjustments facilitate handling any work desired. The entire vise assembly may be rotated around, clockwise or counter clockwise. By means



of a swivel base that locks in any position, the vise may be turned right or left in a complete circle. A special Flexisleeve attachment gives Flexivise endless positioning range. Jaws are 4 in., jaw opening, 5½ in. *Flexivise Co.*

**For more data circle No. 27 on postcard, p. 87.**
***Turn Page***



# Install Switchgear Outdoors

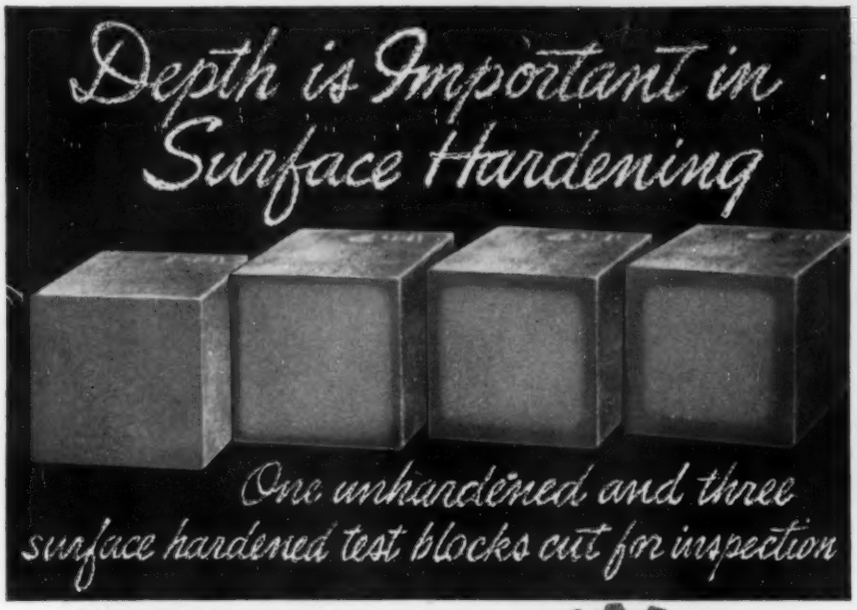
## GET CONVENIENT OPERATION PLUS COMPLETE PROTECTION

When building-cost considerations suggest outdoor switchgear installations, you'll naturally want equipment that can be most conveniently operated and maintained in the open . . . and weatherproofed to protect against rust and corrosion. Westinghouse Outdoor Metal-Clad Switchgear meets these specifications.

***Convenient Operation and Maintenance*** — Easily operated horizontal drawout circuit breakers eliminate lifting and lowering. A few turns of a crank connect or disconnect the breaker. Breakers of like rating are interchangeable and are easily rolled on the adjustable-height transport truck with its combination latching device for breaker and stationary structure.

***Weatherproof Construction***—Utilizing rigid, self-supporting, jig-welded construction features, Westinghouse Outdoor Metal-Clad Switchgear is equipped with a weatherproof housing, special underframe or base, and access doors at both front and rear of the unit. Space heaters and special ventilators in each unit reduce the possibility of condensation. As long-term protection against rust and corrosive elements, the metal frame is Bonderized, prime and finish painted, and the base receives a heavy spray application of all-weather undersurface coating.

For complete facts on outdoor or indoor metal-clad switchgear, write for Booklet 5306. Address: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60793

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*—Your Guarantee of Longer Life*

GUARANTEED PITTSBURGH ARMORED GEARS

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The exact depth of surface hardening is one of the most important factors in the exclusive PITTSBURGH **Armored Gear** formula. The metal, machining, and overall heat-treating are very important in the long service life of PITTSBURGH GEARS, and with surface hardening to the correct depth for the use the gears will be put to, you can expect unusually long service.

PITTSBURGH **Armored Gears** are guaranteed to give five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service. **Armored Gears** are quickly identified by their distinctive corrosion preventive coating of "**Pittsburgh Purple.**"

Let us quote on one of your requirements. Then put the PITTSBURGH **Armored Gear** to work. See how much longer it lasts—and how much less your service cost is. Send your specifications today.

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**MITRE**
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**HERRINGBONE**
**WORM GEARS**
**REDUCERS**
**CRANE WHEELS**

**PITTSBURGH GEAR COMPANY**

27th & Smallman Streets
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Phone: ATlantic 1-9950

subsidiary of **BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS**


## —New Equipment—

*Continued*

### Ventilated clutch

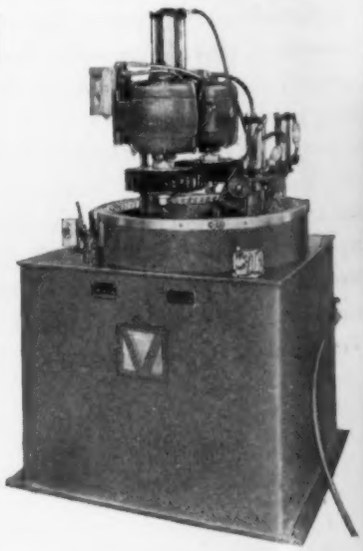
An air-operated industrial clutch, the new Fawick type VC air-ring clutch, is the rigid type, providing transmission of power from the friction shoes through the torque bars to the metal side plates of the assembly. It provides heavy duty service with high-starting loads and sustained slippage where generated operating heat lowers clutch efficiency and shortens operating life. Clutch sizes range from 12 through 42 in. drum diameters with torque capacities ranging from 27,000 to 380,000 in-lb. *Federal Fawick Corp.*

For more data circle No. 28 on postcard, p. 87.

### Deburring machine

Turntable type deburring machine has been developed for rapid deburring of compressor stator rings, half rings or other number of ring sections of jet turbines. Holding ring sections to very accurate diameter during the deburring operation is accomplished by interchangeable holding fixtures for different diameters of workpieces. Modifications of this design can be adapted for deburring other circular workpieces. Complete time cycle is rated at 1 min for loading, deburring and unloading a pair of 32-in. diam aluminum half rings. *Grinding & Polishing Machinery Corp.*

For more data circle No. 29 on postcard, p. 87.



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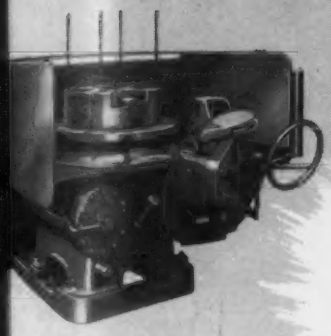
FOR THE *MATERIAL* YOU DRAW—
FOR THE *SIZES* YOU REQUIRE—
FOR THE *TONNAGE* YOU WANT—



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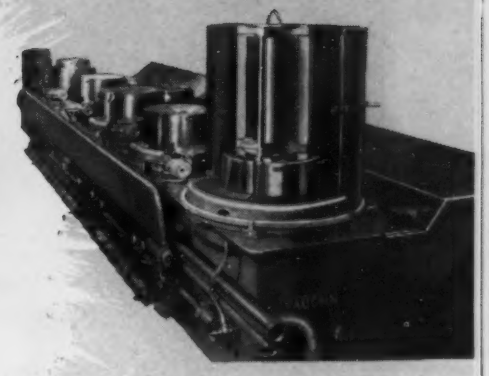
# Vaughn®

has the *RIGHT* EQUIPMENT to handle the job!



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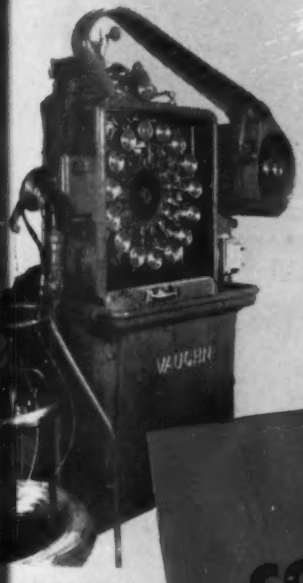

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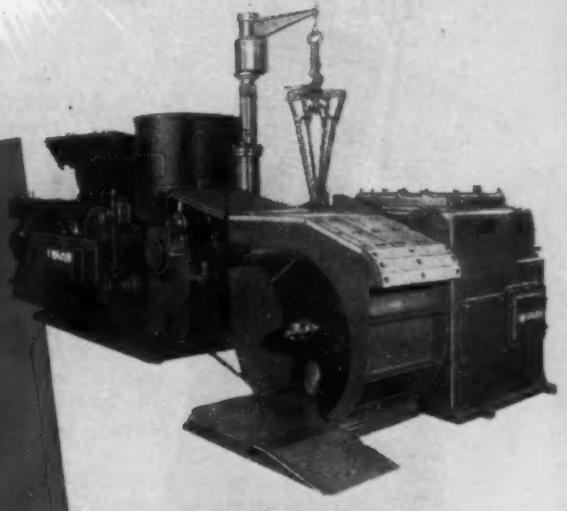

CONTINUOUS MACHINES

"Quick on the Draw!"

## VAUGHN COLD DRAWING EQUIPMENT

WIRE • BARS • TUBES
SPECIAL SHAPES

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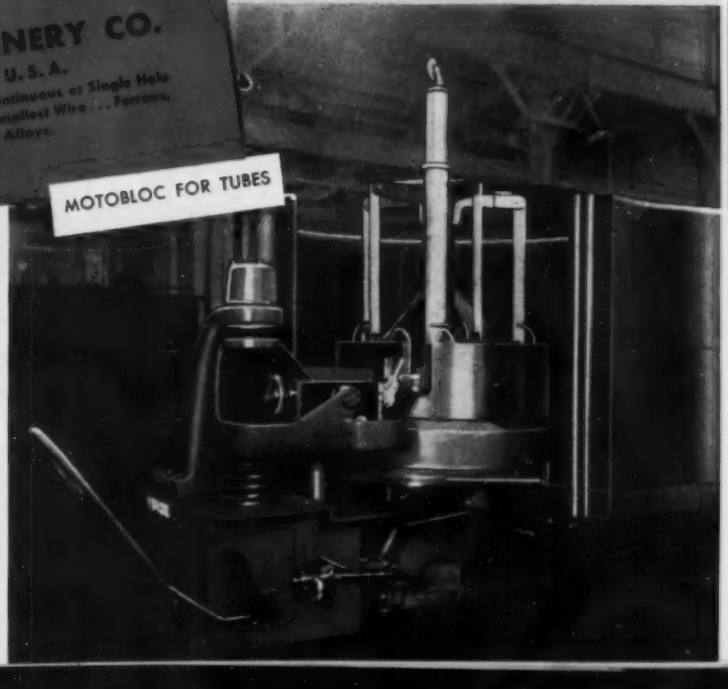
CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

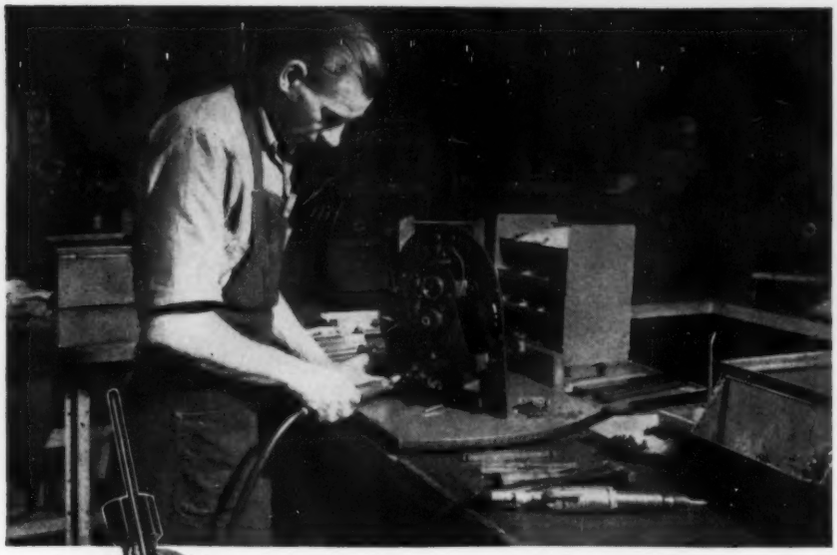
TANDEM MACHINES

MOTOBLOC FOR TUBES



# KELLER Air Tools

## *Increase Production per Man-Hour*



ANOTHER EXAMPLE OF

KELLER *Air Tools engineered to industry*

Keller Screw Drivers and Nut Setters brought important benefits to a manufacturer of duplicating machines. He says: "Since we started using Keller air tools there has been a noticeable reduction in worker fatigue, and increased production per man-hour.

"Our work requires highly skilled, intelligent workers, and these tools have given them better satisfaction in their jobs, and improved our labor relations."

*Weigh less*

*Consume less air*

*Reduce operator fatigue*

*Wide variety of handles, gearings, torques, speeds*

**FACTS IN BRIEF**

**ABOUT KELLER PNEUMATIC SCREW DRIVERS**

*Interchangeable parts*

*Need fewer "back-up" parts in the tool room*

*Clutches, socket drivers, 45° and 90° attachments for every purpose*

Send for

**FREE 36-Page Booklet**

for more information and interesting ideas on air tool application

Keller Tool Company, Grand Haven, Mich.

Please send me a free copy of your booklet on Pneumatic Screw Driving and Nut Setting Tools

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____



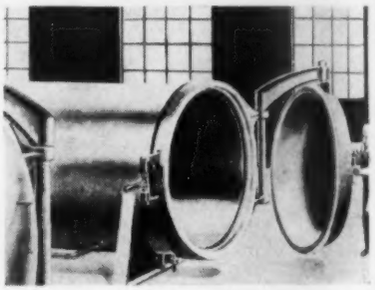

## Blackening process

Black Magic S.S. produces an adherent black finish on stainless steel, cast and malleable irons. It is furnished as a dry salt mixture, which is mixed with water, 5½ lb to 1 gal, and maintained at a boiling temperature of 255° to 260°F. Immersion time in the solution is from 5 to 15 min. *Mitchell-Bradford Chemical Co.*


**For more data circle No. 30 on postcard, p. 87.**


## Quick-opening door

Developed for pressure vessels a quick-opening door can be opened or closed in a few seconds merely by expanding or contracting a split ring. By use of the new type door, one manufacturer in the rubber industry cut the time required for



opening or closing the doors on vulcanizers from 20 min to 30 sec. Quick-opening doors have been built to withstand temperatures to 400°F and pressures to 300 psi. The doors can be adapted for use on equipment operating at atmospheric pressure or under high vacuum. *Blaw-Knox Co.*


**For more data circle No. 31 on postcard, p. 87.**


## Pressure switch

A new pressure switch in an explosion-resisting enclosure for water pumps and air compressors is applicable to conditions where explosive atmospheres are present or highly combustible fuels must be handled. Two types of control are available: a water pump switch has 20 to 80 psi pressure range; an air compressor switch has 40 to 200 psi pressure range, is available with a two-way release valve. Control is adjustable. *Square D Co.*


**For more data circle No. 32 on postcard, p. 87.**

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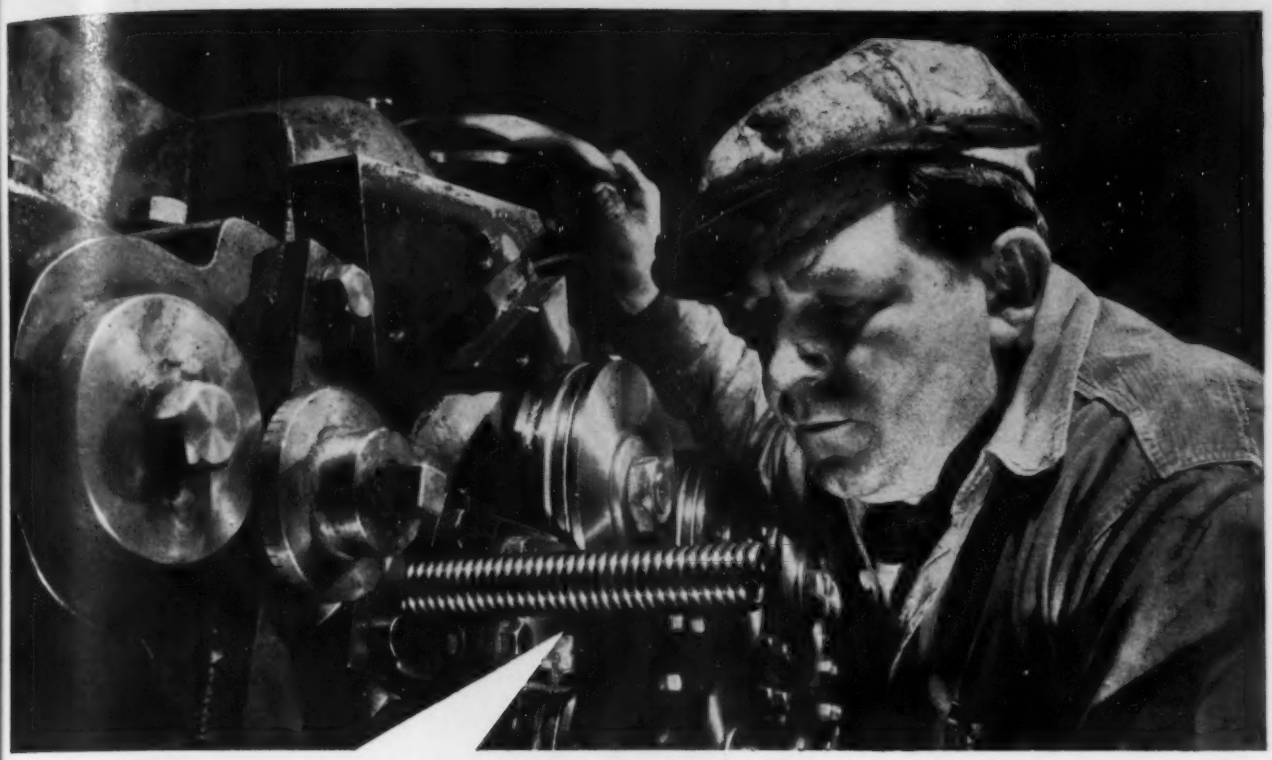


# Users tell the quality story

## Diamond Wire Spring Company makes long runs, eliminates costly breaks with Pittsburgh Steel Oil Tempered Spring Wire

Skilled workmen, modern machines and Pittsburgh Oil Tempered Spring Wire form a combination that is hard to beat for producing quality springs with economy. *Users tell the quality story* better than we can. For example, skilled machine operators at the Diamond Wire Spring Company plant in Millvale, Pa., sum it up this way. They like Pittsburgh Wire because it enables them to make long runs without costly stops caused by broken wire. Matthew Kline, a veteran with twenty years experience making steel springs, said:

"Pittsburgh Wire is good stuff. I can tell by the way it handles whether it's Pittsburgh or some other make. I like it because it keeps my machine going full tilt for long runs. The management likes it too—helps keep costs down."

For this reason, Diamond Wire Spring Company uses tons of Pittsburgh Steel's Oil Tempered Spring Wire to produce thousands on thousands of springs for farm implement machinery and journal box lids for railroads.

If you manufacture springs and other products from wire, we would like to show you how others eliminate production difficulties, maintain high quality of their products with Pittsburgh Oil Tempered Spring Wire. Just give it a trial.

For information about our high quality wire and wire products write Department IA, Pittsburgh Steel Company, Grant Building, Pittsburgh 30, Pa.

**Pittsburgh Wire**

*a product of* **Pittsburgh Steel Company**

# JOHNSON
## *Universal Bronze*

One customer writes: "I always check over the size list of UNIVERSAL BRONZE Bars in the Johnson Catalog before ordering. No use machining away bronze when I can get the right machined diameter from stock. That saves me money two ways—I buy no more metal than I need—and I cut machine set-ups and machine time." Johnson UNIVERSAL BRONZE is completely machine finished inside diameter, outside diameter, and ends. There are 349 different combinations of sizes in cored bars, and 33 sizes of solid bars.

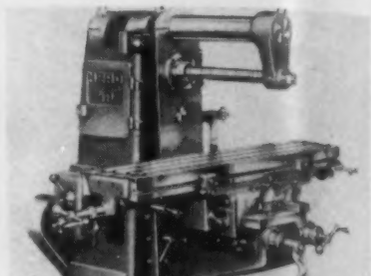
You probably have more applications in your plant for UNIVERSAL BRONZE than you realize. Other manufacturers use it for trolley wheels, sheaves, rollers, guides, spark-proof pinions, special pipe fittings, and air tool tips, as well as for bushings, bearings, thrust plates and washers. Since you can buy it in nearly any size you require, you will save much machining time. Its free-machining properties make further savings. Investigate Johnson UNIVERSAL BRONZE—ask your local Johnson distributor.

JOHNSON BRONZE COMPANY
505 South Mill Street • New Castle, Pa.

**JOHNSON JB BEARINGS**
*Sleeve-Type*

**OTHER BEARING TYPES:**
Standard Stock Size GP Bearings • Electric Motor Bearings • Graphited Bearings • Self-Lubricating Powder Metallurgy Bearings • Babbitt Metal



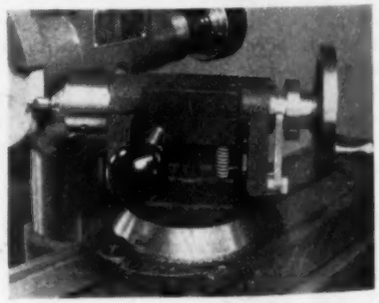
## Milling machine

A new Hero milling machine, plain or universal, has a table size 39½ x 9¼ in. and 6 longitudinal feeds. It features anti-friction bearings, well constructed knee, 12 spindle speeds, 6 table feeds and 2½ hp motor. *Morey Machinery Co., Inc.*

**For more data circle No. 33 on postcard, p. 87.**

## Grinding fixture

Essential features required for relief grinding of end mills, both spiral and straight flutes, counter sinks, spot facers, center drills and reamers, are incorporated in an improved grinding fixture. A rocking head permits drawing the cutter or reamer away from the



wheel for indexing and retracting the spindle. Tools are held in the spindle by collet bushings ranging in sizes from ⅛ to ¾ in., and ¾ to 1 in. A second spindle or special collet bushing can be furnished for holding any 1¼-in. diam cutter or center. One of two bases is hinged for angular grinding. *S & D Engineering Co.*

**For more data circle No. 34 on postcard, p. 87.**

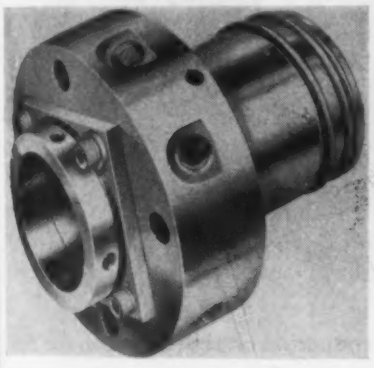
## Anti-icing hose lines

New high temperature hose line for jet engines is constructed of a silicon, rubber-like material. It is used on jet engines to convey hot air at temperatures as high as 450°F and thereby prevent ice from forming on the jet's air intakes. The anti-icing hose line features Aeroquip's Little Gem fitting that is said to introduce a different principle to the problem of sealing fluid inside of hose lines. *Aeroquip Corp.*

For more data circle No. 35 on postcard, p. 87.

## Stuffing box seal

Sealol stuffing box seals for centrifugal pumps are completely pre-assembled, packaged units, ready for installation. Seal faces are protected against damage or contamination in storage or while being handled. No measurements are necessary to properly position the



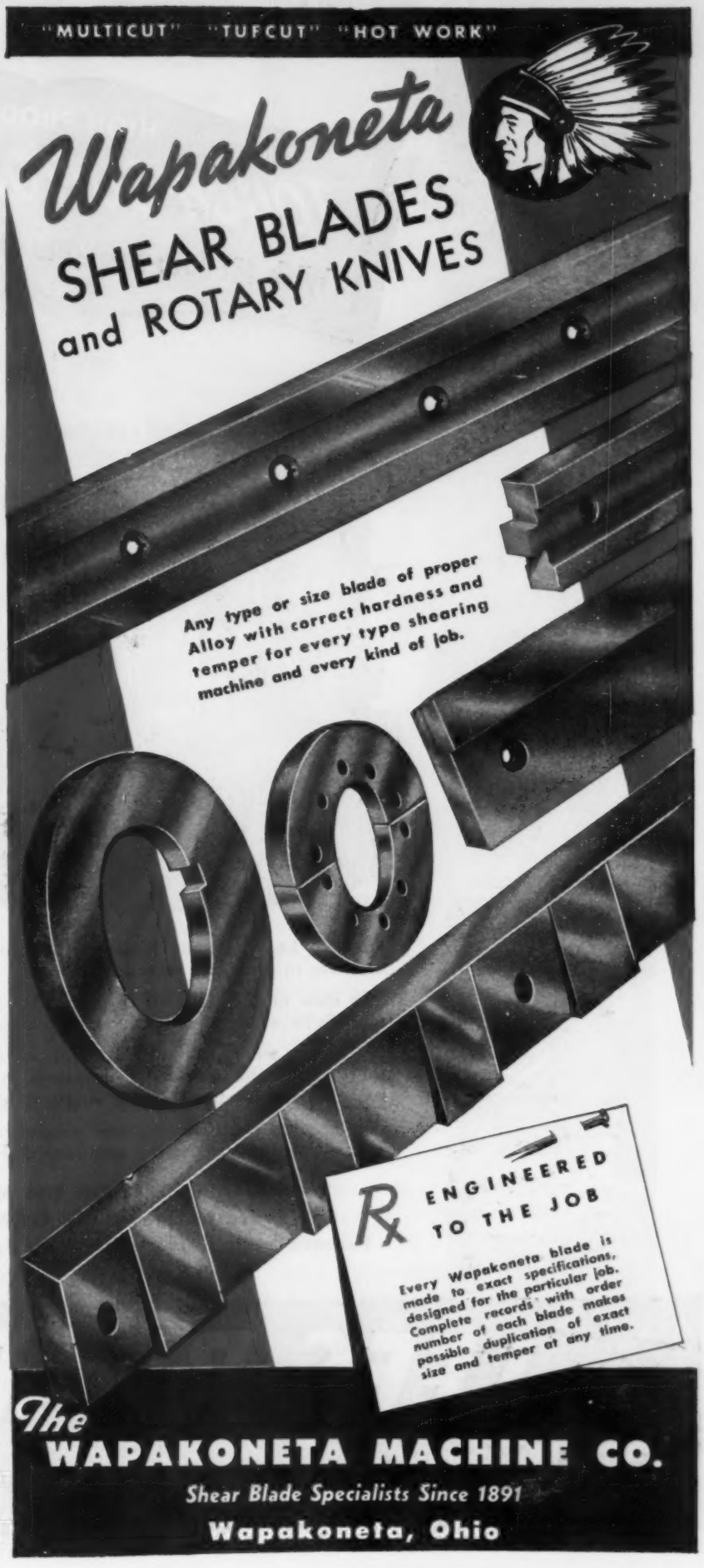
seal on the pump shaft, making installation simple. Each design is engineered for the particular job requirements with special emphasis on ruggedness and durability. Careful control of hydraulic balance maintains minimum face loads to insure long life. *Sealol Corp.*

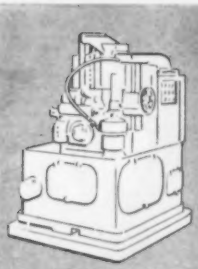
For more data circle No. 36 on postcard, p. 87.

## Steel swivel casters

New heavy duty, steel, double race swivel casters are available in sizes 6, 8 and 10 in. A large diameter outer ball race, precision machined with provision for pressure lubrication, combined with Timken thrust bearing to relieve the load on the countersunk king-bolt, insure easy swiveling under the heaviest loads. The caster is standard with a replaceable bolt axle. *Fairbanks Co.*

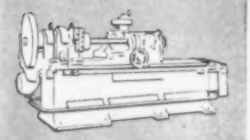
For more data circle No. 37 on postcard, p. 87.



"MULTICUT" "TUFCUT" "HOT WORK"
Wapakoneta
SHEAR BLADES
and ROTARY KNIVES
Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.
TOOL
Rx ENGINEERED TO THE JOB
Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.
The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio

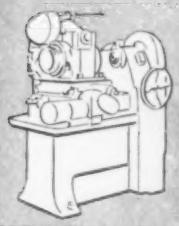


12-S HOBBER

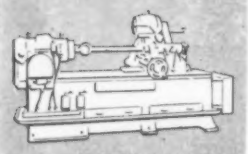
7-A ROTARY HOBBERS



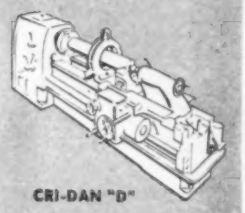
SH SPLINE HOBBER



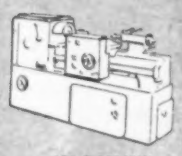
MODEL 40 THREAD MILLER



HT THREAD MILLER



CRI-DAN "D"

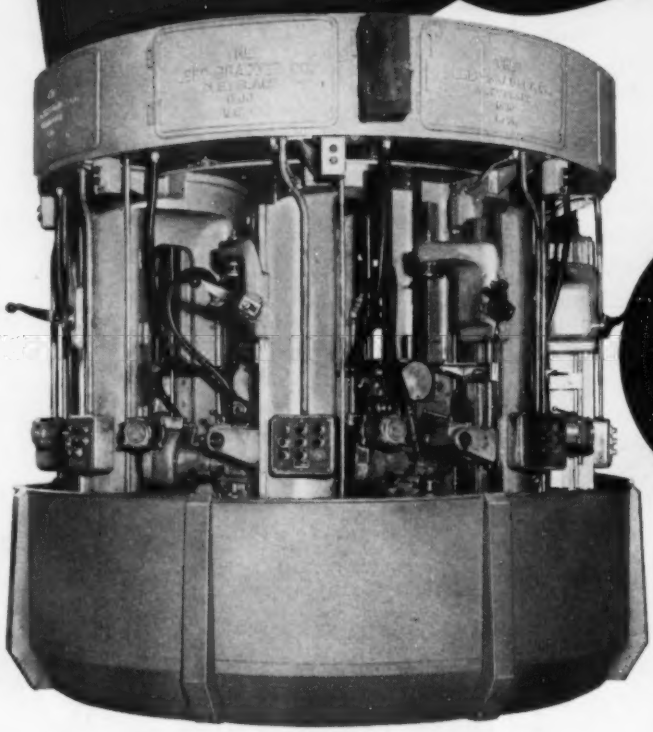


CRI-DAN "B"

HIGH PRODUCTION

# TOUCH-BUTTON HOBBING

With Modern Lees-Bradner 7-A Rotary Hobbers



THE LEES-BRADNER MODEL 7-A 8-SPINDLE ROTARY HOBBER

Look to Lees-Bradner, pioneers in high-production machine tools, for the ultimate in precision hobbing.

The now famous line of Model 7-A hobbers have established remarkable records in leading production plants throughout the country.

No matter what your hobbing job, or the volume of production required, there's a machine to fill your needs in the 7-A line of eight, six and four spindle rotary hobbers or the single-spindle machine.

For detailed engineering and production data call in your Lees-Bradner representative or write the company direct.

**QUICK FACTS ON THE MODEL 7-A HOBBERS**

- **Push-Button Production Controls**
- **Electric Hob Shifter**
- **Electronic Counter for Longer Hob Life**
- **Patented Automatic Hob In-Out Mechanism**

## the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.

The Iron Age

# SALUTES

## *Charles M. Squarcy*

**His contributions to ironmaking science have earned him an AIME award for meritorious services.**

KEEP your eye on Chuck Squarcy. Winner of the American Institute of Metallurgical Engineers' J. E. Johnson Award for meritorious service to the iron and steel industry, he's bound to go places.

The AIME award isn't the first this youthful engineer has received for contributions to his industry. Assistant superintendent of blast furnaces for Inland Steel Co. at Chicago, Chuck has twice before earned awards for his authoritative technical papers.

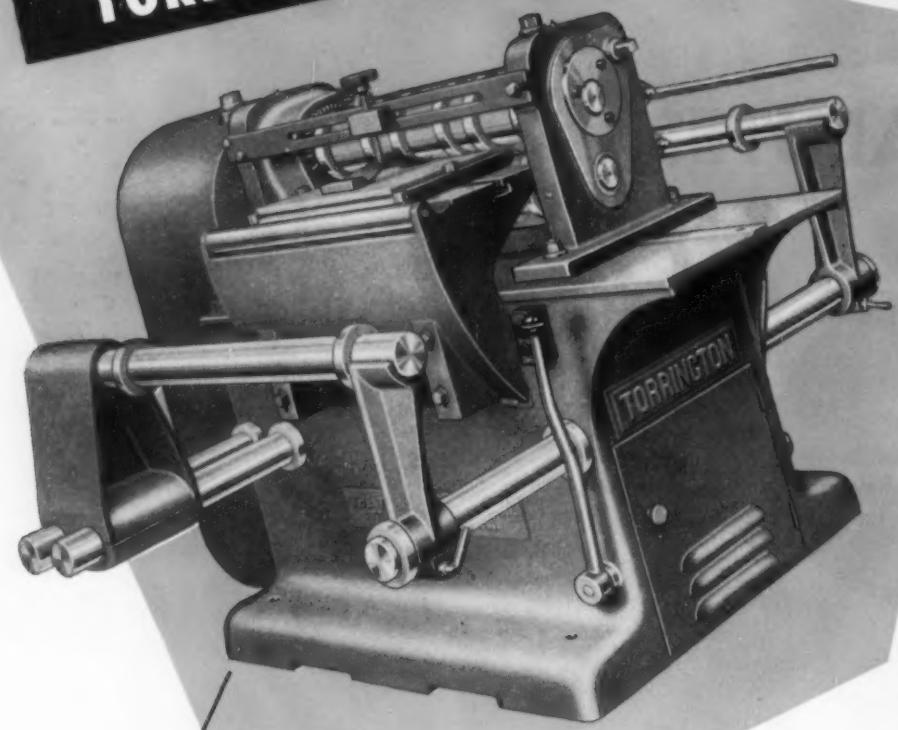
His writings cover such topics as fluidized solids in iron ore reduction, controlled charging and improved stock distribution in blast furnace operation, and effects of coke types in iron production.

Chuck joined Inland as a blast furnace engineer apprentice after graduation from University of Illinois in 1936. He was a full-fledged furnace engineer by 1939, a general foreman in 1947, assistant superintendent of Plant No. 2 blast furnaces in 1950. He was promoted to his present post in 1952.

Meanwhile, Chuck took time out to serve in the Pacific for 3 years with Army Ordnance, rising to Major. He added marriage to his responsibilities in 1940, now has two daughters.

When he's not keeping the wind up at Inland, Chuck heads the Defense Bond drive in East Chicago, Ind. A director of the Blast Furnace & Coke Assn., he's a past membership chairman of AIME. In what time is left over he's an enthusiastic golfer and photographer.

# TORRINGTON SLITTING MACHINES...




## FAMOUS FOR YEARS OF CONTINUOUS, DEPENDABLE SERVICE

These compact, easily operated machines are especially designed to meet the needs of sheet metal fabricators who require slitters that can be quickly set up to produce any desired combination of cuts on any gauge of metal within their range. The product of years of research, development and experience, Torrington Standard Slitters are famous for continuous, dependable service.

THE TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER SIXTY-FIVE YEARS

The Iron Age

# INTRODUCES

**James E. Nolan,** elected vice-president and assistant to the president, SCULLIN STEEL CO., St. Louis; and **Milton O. Kassing, named purhasing** agent.

**John A. Borman,** becomes assistant to vice-president on engineering and production, Industrial Truck Div., CLARK EQUIPMENT CO.; and **Russell Hastings,** assistant in directing activities of engineering staff.

**Paul L. Wing,** appointed vice-president in charge of sales, NEWMAN-CROSBY STEEL CO., Pawtucket, R. I.; and **Stuart A. Woodruff,** named vice-president in charge of production.

**Milton A. Gordon,** elected to the board of directors, AVILDSEN TOOLS & MACHINES, INC.

**Samuel S. Board, Jr.,** appointed director of research, Buffalo, New York, plant, FARREL-BIRMINGHAM CO., INC., Ansonia, Conn.

**Naurice G. Cummings,** elected to board of directors, THE NATIONAL SUPPLY CO.

**Joseph R. Zelenka,** named comptroller, PYRENE MFG. CO., New Jersey. He succeeds **Thomas A. Mulvaney,** who is retiring after 35 years' service.

**C. I. Burdick** has been appointed director of industrial engineering, WILLYS-OVERLAND MOTORS, INC., Toledo.

**David A. Blevins,** appointed production engineering supervisor, ELECTRIC REGULATOR CORP., Norwalk, Conn.

**Dr. R. Genders,** London, England, appointed metallurgical consultant to VANADIUM CORP. OF AMERICA.

**J. F. Wilkes,** appointed director of research and Product Development, DEARBORN CHEMICAL CO., Chicago.

**Francis L. Patrick,** appointed design engineer, LACLEDE ARCH CO., St. Louis.

**Raymond C. Jenness** and **Alvin H. Mattner,** have been named assistant engineers Processing Machinery Dept., ALLIS-CHALMERS MFG. CO.; and **William D. Grabow,** assigned to the Duluth branch office to specialize in field service work of processing machinery.

**Philip D. Pearson,** becomes manager, CALAND ORE CO., Canadian subsidiary of Inland Steel Co.; and **E. W. Whitman, named chief engineer,** Caland's Steep Rock operations.

**Arthur M. Simpson,** named manager, new revolving door division, INTERNATIONAL STEEL CO., Evansville, Ind.; and **Ray Goad,** appointed sales manager.

**R. E. Horton,** appointed manager all branch office operations, BRYANT HEATER DIV., Cleveland.

**Clyde H. Haynes,** appointed manager, Patent Dept., Nelson Stud Welding Div., GREGORY INDUSTRIES, INC., Lorain, Ohio.

**M. G. Brown,** appointed assistant manager, CRUCIBLE STEEL CO. OF AMERICA, Los Angeles Branch.

**Ralph E. Campbell,** appointed Pittsburgh district field engineer, SKF INDUSTRIES, INC.

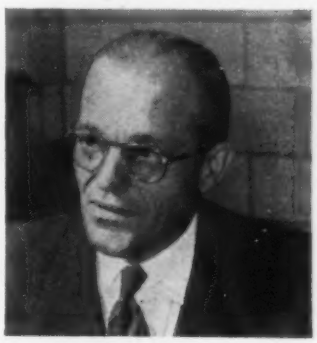
**Earl C. Daum,** appointed managing director, GENERAL MOTORS-HOLDEN LTD.

**Patrick H. Ryan,** appointed sales manager, Asbestos Products Div., NATIONAL GYPSUM CO.; and **William U. Townsend,** becomes commodity manager, same division.

**Eugene A. Pelizzoni,** appointed works manager, Atkins Saw Div., BORG-WARNER CORP.

EDWARD W. LEGIER, elected president, American Blower Corp., Detroit.

W. H. ROWAND, elected a vice-president, The Babcock & Wilcox Co., New York.



TOM R. SMITH, named vice-president-research and development, The Maytag Co., Newton, Ia.

**Jim Davidson**, promoted to general manager, Chain Saw Div., CLINTON MACHINE CO., Maquoketa, Ia.; and **Clete Erlacher**, becomes head of entire sales and services.

**William Beeson**, elected manager of sales, Philadelphia territory, JESSOP STEEL CO., Pittsburgh.

**F. B. Pinzel**, appointed assistant general sales manager, Buffalo Steel Div., H. K. PORTER CO., INC.

**Buckley M. Byers**, appointed general manager of wrought iron sales, A. M. BYERS CO., Pittsburgh. He succeeds the late R. H. Gardner.

**Donald E. Hawkinson**, appointed sales manager, Machine Tool Dept., GREENLEE BROS. & CO., Rockford, Ill.

**Francis K. McCune**, appointed general manager, Atomic Products Div., Schenectady, GENERAL ELECTRIC CO.; and **Samuel E. Q. Ashley**, named manager, Major Appliance Div., Louisville.

**George D. Klick**, appointed advertising manager, LEBANON STEEL FOUNDRY, Lebanon, Pa.

**Albert T. Both**, appointed works manager, Cleveland Operations, CHASE BRASS & COPPER CO., INC., Waterbury, Conn.; and **Charles W. Yarrington**, becomes general superintendent, Chase Cleveland mills.

**Timothy W. Collins**, appointed general personnel director, PITTSBURGH PLATE GLASS CO., Pittsburgh.

**James F. Atkins**, appointed division comptroller, BELL AIRCRAFT CORP., Texas Div.

**Paul K. Scott**, appointed works manager, G. M. DIEHL MACHINE WORKS, INC., Wabash, Ind.

**George M. Graetz**, appointed manager, new Eastern plant, Welding Products Div., under construction at Lancaster, Pa., A. O. SMITH CORP.

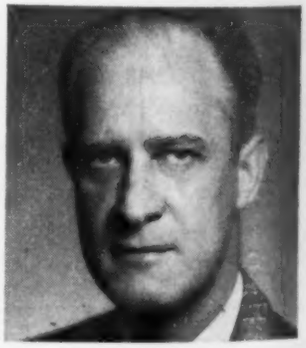
**Major Louis G. Burns**, appointed chief pump engineer, Chandler-Evans Div., NILES-BEMENT-POND CO., West Hartford, Conn.

**James V. Burrell**, appointed Michigan district sales representative, THE ELECTRIC FURNACE CO., Salem, Ohio.

GEORGE T. PFIFER, appointed controller and assistant treasurer, National Can Corp.

M. NEILSEN, head of the Manufacturing Dept., Boiler Div., The Babcock & Wilcox Co., New York.

VERNE C. STORY, appointed manager of field operations, Lamson Corp., Syracuse.



L. R. McCLARY, appointed manager, Commercial Evaluation Dept., General Research Organization, Olin Industries, Inc.


SELECT A Sterling THAT FITS YOUR JOB!

TUBULAR STEEL FRAME

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

WOOD HANDLE BARROW

DEALERS: Want to sell quality wheelbarrows? You can on our non-exclusive basis. Write for details.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A 5714-3/5-R2

# CONTINENTAL'S PROOF BOOK

**R. E. Brumbaugh**

Secretary and Purchasing Agent of the Auer Register Company, Cleveland, Ohio. Mr. Brumbaugh supervises all of the buying for this concern, which is one of the leading manufacturers of registers and grills in the country.

**THE *Auer* REGISTER COMPANY**
6600 CLEMENT AVENUE, CLEVELAND 5, OHIO

March 12, 1953

Continental Screw Company
New Bedford, Massachusetts

Gentlemen:

This is to inform you of the very gratifying results which we have experienced since using your Holtite taped screws in our operation.

It is necessary to supply two installation screws with each of our units, and we had for many years been packaging them in small cloth bags secured with a tie-string. A considerable saving was experienced when we substituted a kraft envelope for the cloth bag. The advantages realized by subsequent conversion to Holtite taped screws are obvious when you examine the following table of costs:

| Packaging Unit | | Packaging Labor | Total |
|---|---|---|---|
| Bag | $8.75M | $2.40M | $11.15M |
| Envelope | 1.90M | 2.05M | 3.95M |
| Taping | .90M | -0- | .90M |

This table tells a story, and it is indeed a good one. However, it does not point out the many errors of mixing and improper selection which taped screws have eliminated in our own handling.

We sincerely appreciate the personal touch and follow-up which are characteristic of Continental in supplying us with a product unsurpassed in quality.

Yours very truly,

THE AUER REGISTER COMPANY

R. E. Brumbaugh

Secretary

*You too can count on Continental®*

CONTINENTAL SCREW COMPANY INC. ★ 1904 ★

**Manufacturers of HOLTITE Fastenings For Every Purpose**

CONTINENTAL SCREW COMPANY, NEW BEDFORD, MASS., U.S.A.

Get the facts of life

(TAP LIFE, OF COURSE)

with

THREADWELL'S 56 PAGE FACT FILLED TAP MANUAL

Send us the coupon and we'll have your Threadwell Distributor get your FREE copy to you!

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GREENFIELD, MASS. U.S.A.

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A


## Personnel

*Continued*

**George Martin,** appointed general service manager, TRAILMOBILE INC., Cincinnati.

**Stanley T. Johnson,** appointed purchasing agent, nonferrous metals, U. S. STEEL CORP., Pittsburgh.

**Francis J. Frasor,** named purchasing agent, THE DIVERSEY CORP., Chicago.

**T. H. Herbst,** appointed factory manager, UNITED TUBE CORP., Ohio.

**Jerome J. Fisher,** appointed general manager, Houston Div., COMMERCIALS METALS CO.

**A. W. Hooper,** appointed exclusive representative, Alabama, LEWIS-SHEPARD, Watertown, Mass.

**Frank T. Shiba,** appointed manager of sales, Structural & Ornamental Divs. of BUILDERS STRUCTURAL STEEL CORP., Cleveland.

### OBITUARIES

**Robert A. Bell,** president, The Rajah Co., Bloomfield, N. J., recently.

**J. Gordon Turnbull,** founder and president, J. Gordon Turnbull, Inc., and consulting engineer for the design of many industrial and military installations, at his Los Angeles home, after an extended illness.

**H. W. Hill, 63,** director and vice-president in charge of operations, Northwestern Steel and Wire Co., suddenly at his home near Sterling, Ill., of a heart attack.

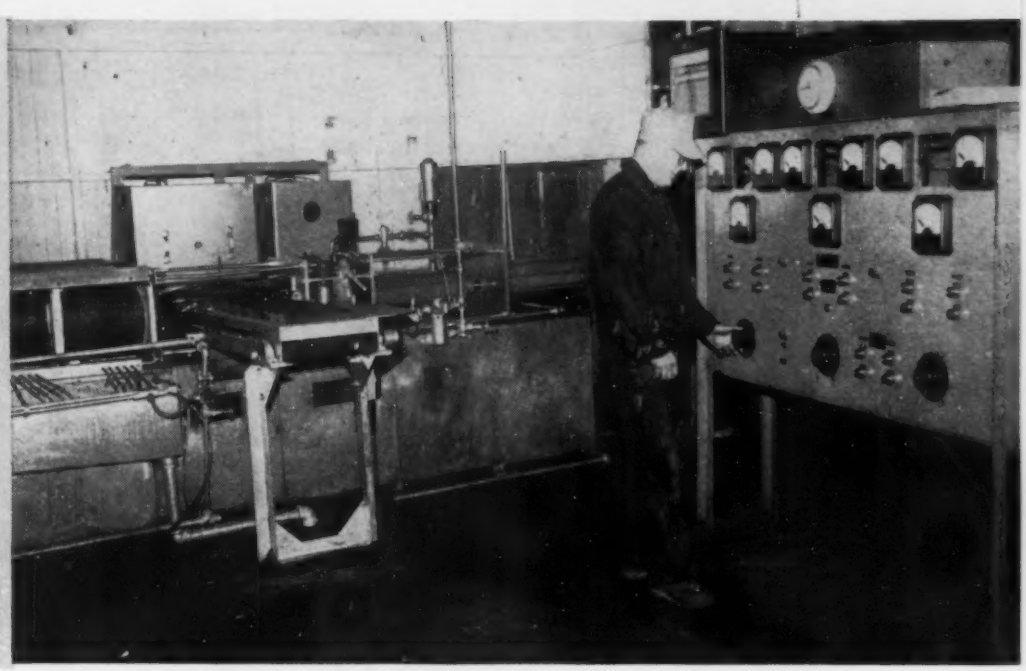
**Vere B. Browne,** 70, director and honorary vice-president, Allegheny Ludlum Steel Corp.. in New York, recently. He was one of the pioneers in developing stainless steels.

**Emmy Stuke, 50,** administrative assistant to the president of U. S. Steel Export Co., suddenly in Sheffield, Mass.

**Dr. J. S. Chalmers,** medical director, Sheffield Steel Corp., and Bethlehem Supply Co., suddenly.

**W. W. Collins,** superintendent of mechanical maintenance and master mechanic, Sand Springs Div., Sheffield Steel Corp., suddenly.

**Joseph S. Cowan,** 59, manager of government business at the Washington office of National Electric Products Corp., recently, in Washington after a brief illness.



DUAL-FREQUENCY billet heater heats 200 billets per hr to forging temperature. It uses 60 and 3000-cycle power for low- and high-frequency coils, respectively.

# Dual-Frequency Induction Heating LOWERS PROCESS COSTS

- A new concept in induction heating, using dual frequencies has reduced capital outlay and operating costs.
- This method uses two sets of continuous coils —a low-frequency heat tunnel is followed by a high-frequency section . . . Low-frequency current is taken directly from a 50 or 60-cycle main power supply.
- In one installation, one man heats 200 billets per hr to forging temperature . . . Reduced scale loss saves 300 lb of steel per hr . . . Space requirements are small.

By R. S. Segsworth
Director of Research
General Engineering Co., Ltd.
Toronto

• DESPITE low-cost electricity in many areas, use of induction-heating equipment has sometimes been rejected because of cost. To place the advantage of induction heating within reach of a larger segment of industry, the General Engineering Co., Ltd., Toronto, decided to find some means to reduce equipment cost. Its success is gaged by equipment now available at a cost competitive with that of oil or gas-burning equipment, and at an operating cost usually lower.

The first step was a search for cheaper high-frequency power source. Mercury vapor tubes seemed to offer certain advantages but control problems precluded their use. Magnetic amplifiers also failed to produce a practical solution. In the range of 3000 to 10,000 cycles, conventional motor-generator sets probably offered

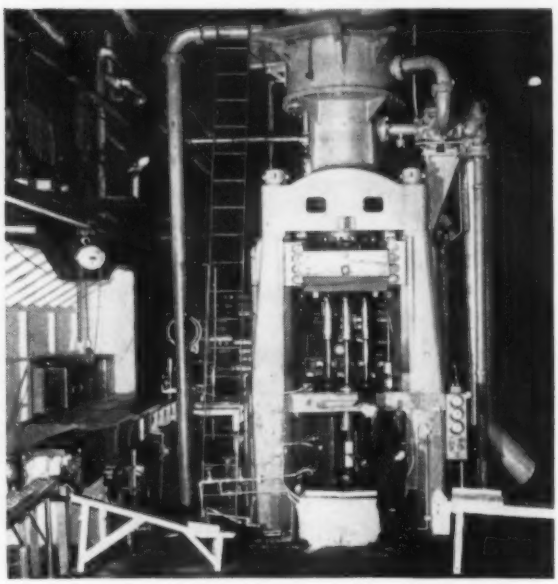
***Two frequencies used to heat magnetic materials . . . Lack of frills cuts maintenance.***

the best source of power while in the higher frequencies, studies suggested the development of rotating equipment without using iron. However, until certain practical problems are solved, vacuum tube equipment must be used for the higher frequencies.

Cost of frequency converting equipment generally decreases with a decrease in the frequency supplied. Except for very small parts and where surface treatment only is required, frequencies much below 10,000 and even below 3000 are entirely practical. Below 3000 cycles it is sometimes possible to use salient pole generators in place of heterpolar equipment with a saving in cost.

An interesting development is the self-excited generator which has all the rugged characteristics of the conventional squirrel-cage motor, is reasonably efficient, inexpensive, and can supply power in frequencies up to about 1000 cycles. Its characteristics make it difficult to apply when more than one heating station must be used with one generator. However, low cost makes it practical to use one generator for each load thus simplifying the control.

Further development led to use of power at lower frequencies. Once limiting factors were understood, efficiency was achieved in a wide variety of applications, especially where large amounts of power are required and savings are high.



FORGING PRESS is at discharge end of a billet heating line. Billets measuring 3¼ in. sq and weighing 31 lb are heated to 1400°F in low-frequency coils, then brought to 2200°F in high-frequency coils.

Coil designs ultimately developed used power at normal commercial voltages and eliminated the need for special transformers. Besides saving in capital cost, low frequencies provide for deeper penetration and more uniform heating. Use of two or more selected frequencies also make it possible to uniformly heat objects of uneven cross-section.

Two frequencies may be used advantageously to heat magnetic materials. Parts can be heated with 60-cycle power to just below the Curie point, limiting the need for heating with expensive high-frequency power above that point. In forging, about half the power is applied directly at 60 cycles, reducing the generator installation proportionately. Efficient heating to forging temperature is usually possible with 60-cycle power for 6-in. sq material or larger, making generators unnecessary.

Further savings are possible by getting rid of all frills in both the mechanical and electrical design and adhering to rugged simplicity. This approach also reduces possible sources of maintenance troubles.

The first billet heating installation was made in the plant of the Canadian Arsenals Ltd., Lindsay, Ontario. Billets approximately 3¼ in. sq and weighing about 40 lb were heated to forging temperature.

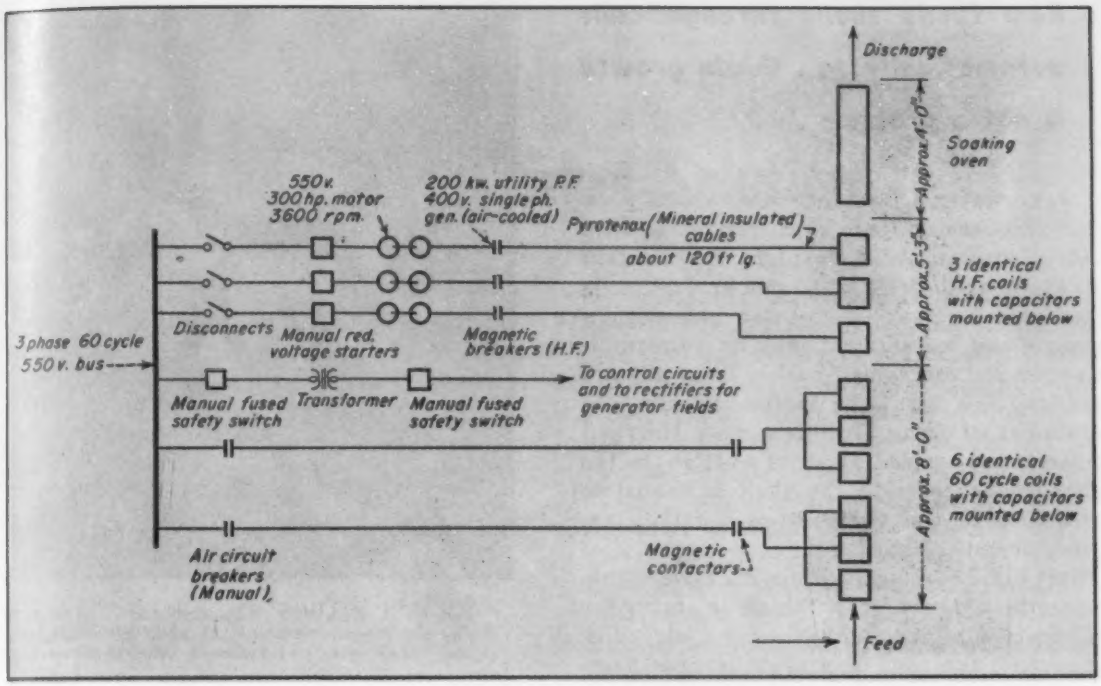
### One man operates machine

Later, a larger installation was completed in the plant of Trenton Steel Works, Trenton, Nova Scotia. Billets are also about 3¼ in. sq and weigh about 31 lb. In this machine, 3-phase, 60-cycle power at 575 v is applied to low-frequency heating coils. In these coils, temperature of the billet is raised from room temperature to about 1400°F. Billets pass continuously through these low-frequency coils and through a series of coils operated at 3000 cycles where the temperature is raised to approximately 2200°F for forging.

One man operates the machine, including feeding the billets and making adjustments in feed rate and power input when necessary. A radiation pyrometer near the discharge end, focused on the billet, indicates and records the temperature on a strip chart. Normal production is about 200 billets per hr. At this capacity, power consumption, taken at the power company's meters to include generator and transmission losses, is about 800 kw.

Ability to obtain suitable units in the time available dictated use of 3000-cycle generators although 1000-cycle power for the high-frequency end may have been more desirable. Advantages of this installation include almost total elimination of scale, savings in man power and space, improved working conditions and reduced cost.

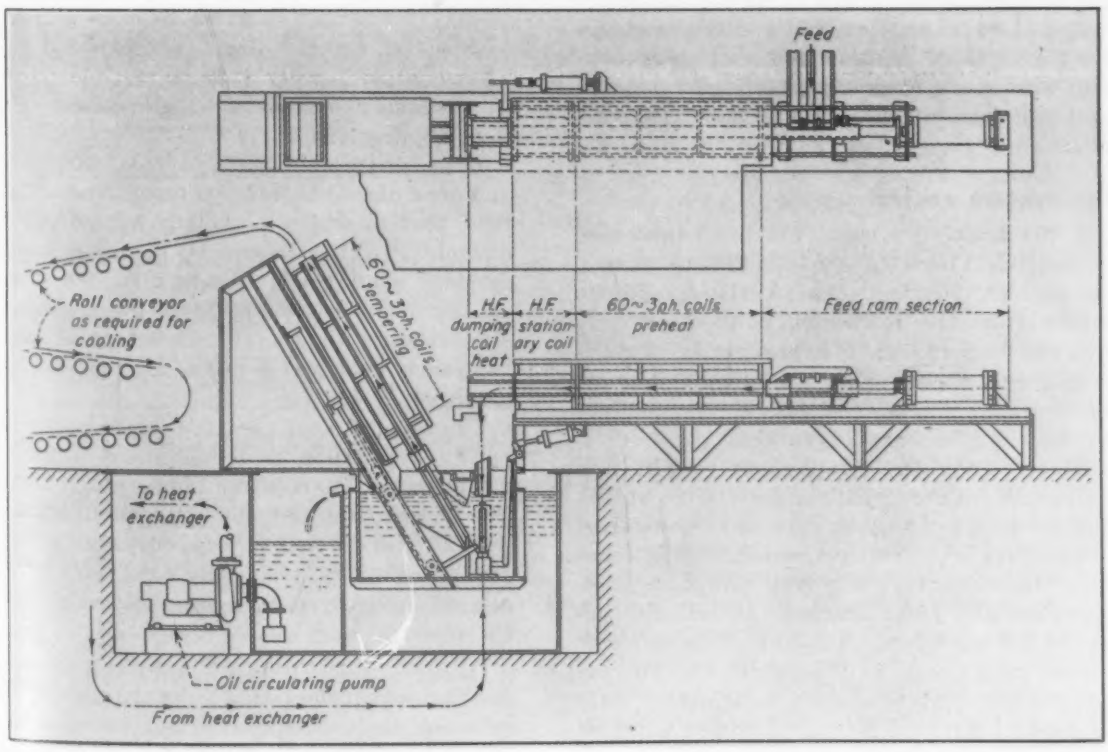
Previous experience with fuel furnaces in-


Discharge
Soaking oven
Approx. 4'-0"
550 v. 300 hp. motor 3600 rpm.
200 kw. utility P.F. 400 v. single ph. gen. (air-cooled)
Pyrotenax (Mineral insulated) cables about 120 ft lg.
Approx. 5'-3"
3 identical H.F. coils with capacitors mounted below
Disconnects
Manual red. voltage starters
Magnetic breakers (H.F.)
3 phase 60 cycle 550 v. bus
To control circuits and to rectifiers for generator fields
Manual fused safety switch
Transformer
Manual fused safety switch
Approx. 8'-0"
6 identical 60 cycle coils with capacitors mounted below
Air circuit breakers (Manual)
Magnetic contactors
Feed

ELECTRIC SETUP for a dual-frequency installation, using three 3000-cycle generators for high-frequency coils. This installation eliminates all scaling, is more compact and saves manpower and space.

dicated that with billets of this size, loss of metal to scale would be about 1½ lb per billet. At 200 pieces per hr, this represented 300 lb of steel per hr worth about $19. Even at the high price of 1.3¢ per kw-hr, power for induction heating of 200 billets cost only about $10.40. Reduction in scale loss alone more than covers the cost of running the induction-heating furnace.

Another unique application of induction heating is for heat treating a hollow shell with a thick base and thin tapering walls. It presented a difficult problem because uniform heating was required throughout the part. This prob-




SHELL heat-treating machine uses two carefully selected frequencies to heat treat hollow shells with thick bases and thin tapering walls. The setup heat treats 3-in. shells at rate of 60 per hr.

***Ram feeds shells through coils automatically . . . Grain growth is not a problem . . .***

lem was overcome by using two carefully selected frequencies. This arrangement is used at the Canadian Arsenals plant for treating 3-in. shells at the rate of 60 per hr.

Shells to be heat treated are placed in a magazine and fed automatically by a hydraulically-operated ram which pushes them through the coils. The first coils in this machine are operated at 60 cycles. In this section, the shell temperature is raised to about 1400°F. In the higher-frequency coils, the shell is heated to about 1550°F, the temperature normally required for quenching.

These higher-frequency coils are divided into two sections, the first of which is stationary and directly in line with the 60 cycle coils. The second, arranged on a pivot, is tilted from the horizontal to the vertical position by a pneumatic cylinder. When the shell in this second coil reaches the desired temperature, it is tilted to the vertical position and discharged automatically into the oil quench tank below.

Oil in the quench tank is held at a constant level and is circulated by a pump through a heat exchanger to keep it at proper temperature. Oil from the exchanger enters the tank through a spigot which holds the shell and is located inside of it while it is in quenching position. Auxiliary jets direct oil against the outside of the shell to effect complete and rapid cooling. A pneumatic cylinder tilts the spigot into the inclined position and another mechanism, also operated pneumatically, picks up the shell and feeds it through inclined tempering coils.

### Temperature control simple

In the tempering coils, the temperature of the shell is raised to about 900°F to give it the desired physical characteristics. Shells emerge from the tempering coils about 8 ft from the floor and travel over a series of gravity conveyers where they cool in air to room temperature. Shells then pass to the production line for finishing operations.

Compared to the conventional oil-heating equipment, this machine can be started at any time by merely pressing a button. Control of temperature is extremely simple and fully automatic. Instrumentation is very simple, consisting essentially of an ammeter to indicate current in a higher-frequency coil. This ammeter is used as a check on the predetermined current setting and to assure satisfactory heat treatment. Rate of feed and power supplied to the various coils can be adjusted. Normal control consists only of minor adjustments in the feed rate to compensate for minor variations in the shell.

INDUCTION MELTING with a low-cost furnace was made possible by development of a self-excited generator. Hand valve and hydraulic cylinder make operation easy.

A maximum of 17 shells are in the machine at any one time compared to the several hundred in oil-fired equipment of equivalent capacity. Floor space for this machine is only a small fraction of that required for oil-burning equipment.

When hardening or tempering by induction heating, there is no need for soaking for prolonged periods to heat uniformly. Unlike other heating methods, induction heat is generated within the material itself, not external to it. The required temperature is reached quickly. In hardening operations, 1 min is ample for most applications.

With induction heating, a particularly difficult steel can be heated to a temperature higher than that to which a shell is heated prior to quenching. This treatment by other heating methods would be unsatisfactory due to possibility of grain growth. Since grain growth is a function of time and temperature, induction heating is practical because the time factor is negligible.

The type of steel used for shells makes tempering a function of temperature. Once this steel reaches the required temperature, tempering is complete. No difficulty is encountered due to the short time allowed for this operation, but, if necessary, tempering conditions may be altered instantly to accommodate variations in the steel.

A third application of low-cost induction heating was made possible by the development of a self-excited generator for induction melting. The furnace used is a conventional type except for hydraulic cylinders used for tilting.

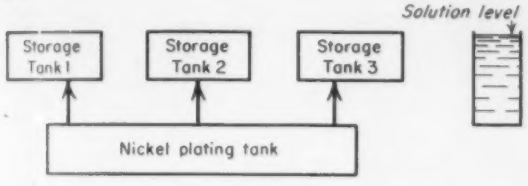
# Small Plating Plants:

# How To Save Nickel Solution

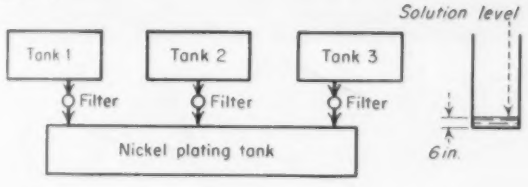
♦ A SIMPLE CHANGE in the method of dumping nickel storage tanks—a method equally applicable to small plants using acid copper and nickel—is saving General Motors' Pontiac Div. an estimated $9600 per year of peak production. Estimated monthly saving of nickel plating solution is 1200 gal.

The method, developed from the suggestion of a Pontiac employee, requires no special equipment. Its adoption has helped Pontiac's long-range plans for eliminating stream pollution. The employee who suggested the method was awarded a $1000 U. S. Government Bond.

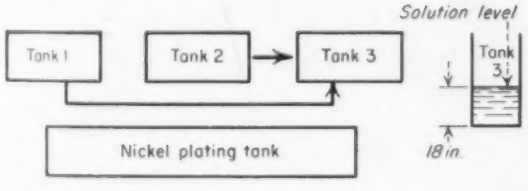
STEP 1



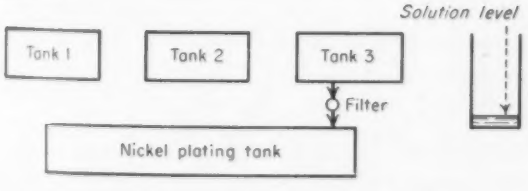

STEP 2




STEP 3




STEP 4




STEP 1—Nickel plating solution is pumped into storage tanks and carbon treated.

STEP 2—Remaining solutions in tanks 1 and 2 are pumped through filters back to plating tank leaving about 6 in. of high carbon content solution in each storage tank.

STEP 3—Remaining solutions in tanks 1 and 2 are pumped into tank 3 and allowed to settle about 48 hr.

STEP 4—After settling, clear solution from tank 3 is pumped through filters into nickel plating tank. Final step is to dump high carbon content solution remaining in storage tank after 6 to 8 weeks of alternate pumping and settling.

Use of acid copper plating requires periodic additions of carbon to the solution for purification purposes. As the carbon settles in the storage tank, it takes impurities with it to the bottom of the tank. Under normal conditions, the storage tanks can be pumped out to a level of about 6 in. without disturbing the accumulated sludge.

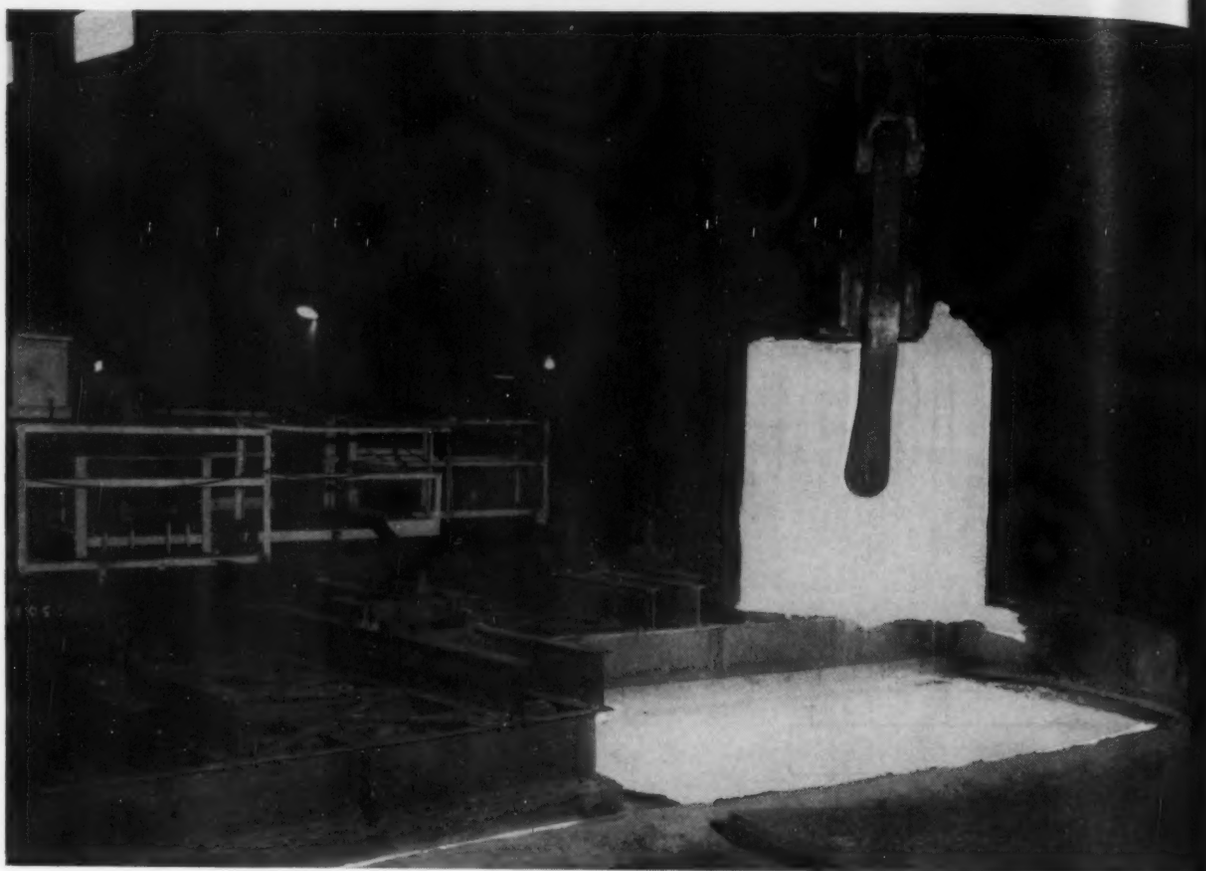
Prior to adoption of the new dumping method, Pontiac pumped down its storage tanks to about the 6 in. level and then dumped each of the three tanks. Since this operation had to be repeated every 6 to 8 weeks, disposing of the residue in the tanks—as well as the resulting loss of nickel—presented a serious operating problem. Steps 1 through 4 show schematic diagrams of the layout for nickel plating and three storage tanks at the Pontiac plant. Using the new plan, Pontiac now starts to pump out the nickel plating tank at midnight on a Friday night. The solution is transferred completely to storage by Saturday morning.

After purification treatment, the storage tanks are permitted to settle until 7 A M Sunday morning. Solution is pumped down to a level of about 6 in. in each tank. Sufficient water is then added to the plating bath to bring this tank up to a proper working level.

Instead of dumping all three of its nickel storage tanks, at this point Pontiac now uses the following plan suggested by Mr. Brockmiller.

The solution remaining in No. 1 tank is pumped into No. 3 tank. No. 2 storage tank is also pumped into No. 3 tank. The solution is permitted to settle for 24 to 48 hr. At this point, some of the solution is pumped from the top back into a clean storage tank. This operation is repeated periodically over 6 to 8 weeks, with alternate pumping and settling taking place until most of the concentrate remaining in No. 3 tank can be removed with a shovel.

Thus, except for the small amount of liquid that accumulates when the No. 3 storage tank is finally washed out, none of the nickel plating solution goes down the drain anymore at Pontiac. Meanwhile, the liquid being drawn off the No. 3 tank is available for use and is pumped into the plating tank as required.



NEW SOAKING PITS increased capacity from 8000 tons to 20,000 to 25,000 tons per row per month for each of three rows. These bottom-fired recuperative-type pits use 900,000 Btu less per ton of heated steel.

# Restored Slabbing Mill ATTAINS HIGH OUTPUT

By Scott Elliott
Slab Mill Superintendent
U. S. Steel Co.
Gary

◆ Modernizing a 36-in. slabbing mill has boosted production to a new high . . . Now, a smaller crew produces 269 tons per turn more.

◆ New soaking pits, besides having greater capacity, use about 900,000 Btu less per ton . . . Improved handling equipment increases rolling rate and provides smoother operation.

◆ Scale removal no longer requires a mill shutdown . . . Continuous pumping of water into concrete-sluice troughs at the rate of 10,000 gpm removes scale and debris to a sump.

◆ SLABBING CAPACITY can be a big problem in a steel mill when flat-rolled products are in heavy demand. The problem gets even bigger when increased demands are placed on soaking-pit furnaces, and the slabbing mill is of such age that its rolling capacity cannot satisfy these demands.

One way to overcome the problem is to rehabilitate existing equipment. This was done with the 36-in. slabbing mill at the Gary Works of the United States Steel Co. The change, besides being made at relatively low cost, increased capacity to a high level.

Three rows of Swindell-Dressler soaking pits replaced the older coke-oven gas-fired regenerative-type pits. The new pits are 21 ft 3 in. long x 15 ft 6 in. wide x 10 ft 6 in. deep, with two holes per row. They are of the bottom-fired recuperative type, with single burners on both ends burning coke-oven gas. Temperature is controlled automatically by thermocouples set in the pit walls. The pits are also equipped with fuel-air ratio controls, furnace-pressure controls, and fuel and air meters.

The new type pits reduced fuel consumption from 1,600,000 Btu to 700,000 Btu per ton of treated steel. In addition, monthly pit capacity increased from 8000 tons per row to 20,000 to 25,000 tons per row.

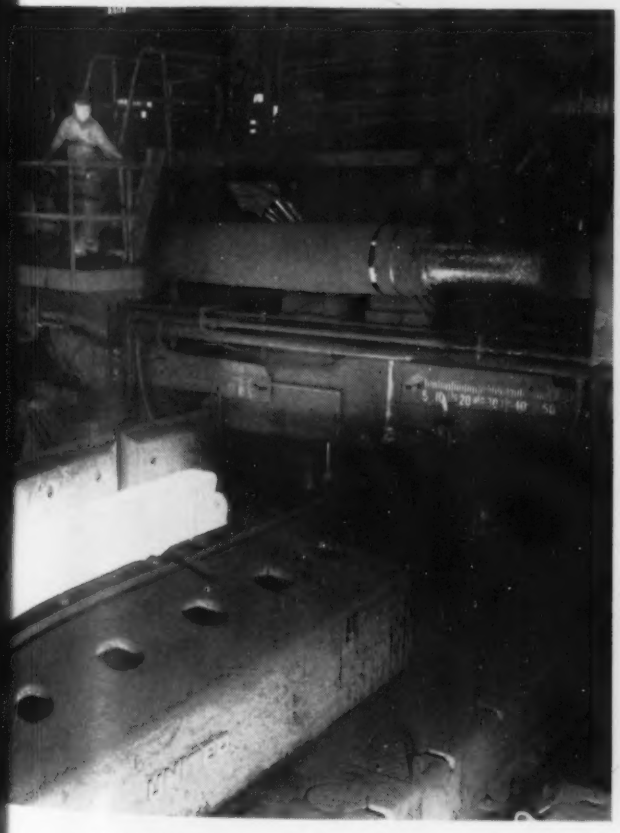
Three other rows of regenerative pits were changed from four holes per row, each measuring 7 ft 9 in. long x 6 ft 6 in. wide x 8 ft 6 in. deep to three rows of two large holes measuring 7 ft 9 in. long x 16 ft. wide x 8 ft 6 in. deep. These remained as manually-operated reversing regenerative pits, using four pipe-type burners per side per hole, firing being through the top of the crown. These changes also helped to increase pit capacity and lower fuel consumption.

Two new 25-ton electric-overhead pit cranes with telescoping rams handle the extra tonnage efficiently. Ingots, removed from the soaking pits by these cranes, are placed on an ingot buggy for delivery to a receiving roller table at the mill. Two such tables move the ingots to the mill approach table.

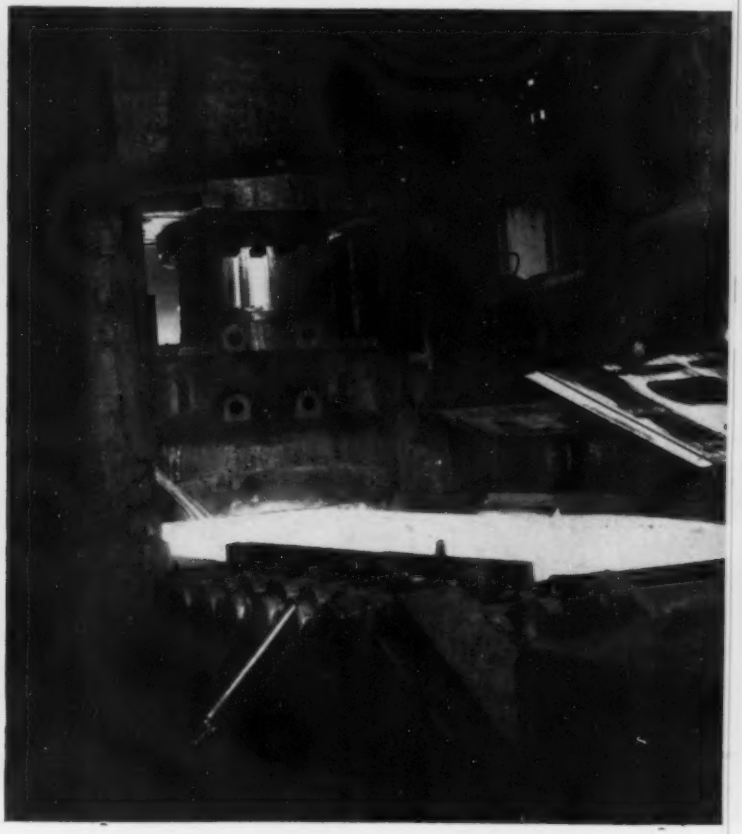
To reduce mill-handling time, changes were made in the approach-table manipulating equipment. Electrically-operated side guards and fingers were designed and installed in place of the hydraulically-operated fingers and stationary side guards previously used. Four 150-hp motors power the two side guards through gear reducers and racks. This new equipment handles ingots ranging from 11,000 to 36,000 lb.

The 36-in. slabbing mill is a steam-driven two-high reversing type. A four-cylinder twin-tandem compound engine delivers about 7000 hp to the two horizontal rolls. About 3500 hp on the vertical rolls is delivered by a three-cylinder cross-compound engine which is connected to each roll by a spindle-driven shaft with spur and miter gears. No changes were made to the engines during this program.

Ahead of the vertical rolls on the mill approach table, two feed-table rollers previously driven by the table shaft are now driven independently by a 50-hp motor through reduction gears. The old mill also used an idler roll to bridge the 81-in. gap between the vertical and horizontal rolls. This idler has been replaced by a heavy feed-



MANIPULATORS at mill approach table speed slab handling. The two large side guards are powered by four 150-hp motors through gear reducers and racks. The manipulator fingers can handle 18-tons slabs.



CROP SHEAR AND GAGE have been reconditioned to handle slabs up to 69½ in. wide and 18 ft long. The shear is a steam-hydraulic downcut type with a 24-in. opening, having a maximum cutting force of 3600 tons.

***"After 2 months, mill averaged 1369 tons compared to previous rate of 110 tons per turn . . ."***

table roller driven by a motor and gear reducer. By powering these rollers individually, operation has been made smoother and the rolling rate increased.

A new roller table on the approach side of the mill is driven by two 150-hp motors while the table on the delivery side is driven by one 150-hp motor through individual line shafts. From the mill, rolled slabs are delivered to a reconditioned crop shear. It is a steam-hydraulic downcut shear capable of opening 24 in. Its maximum width is 69½ in. and it has a maximum cutting force of 3600 tons.

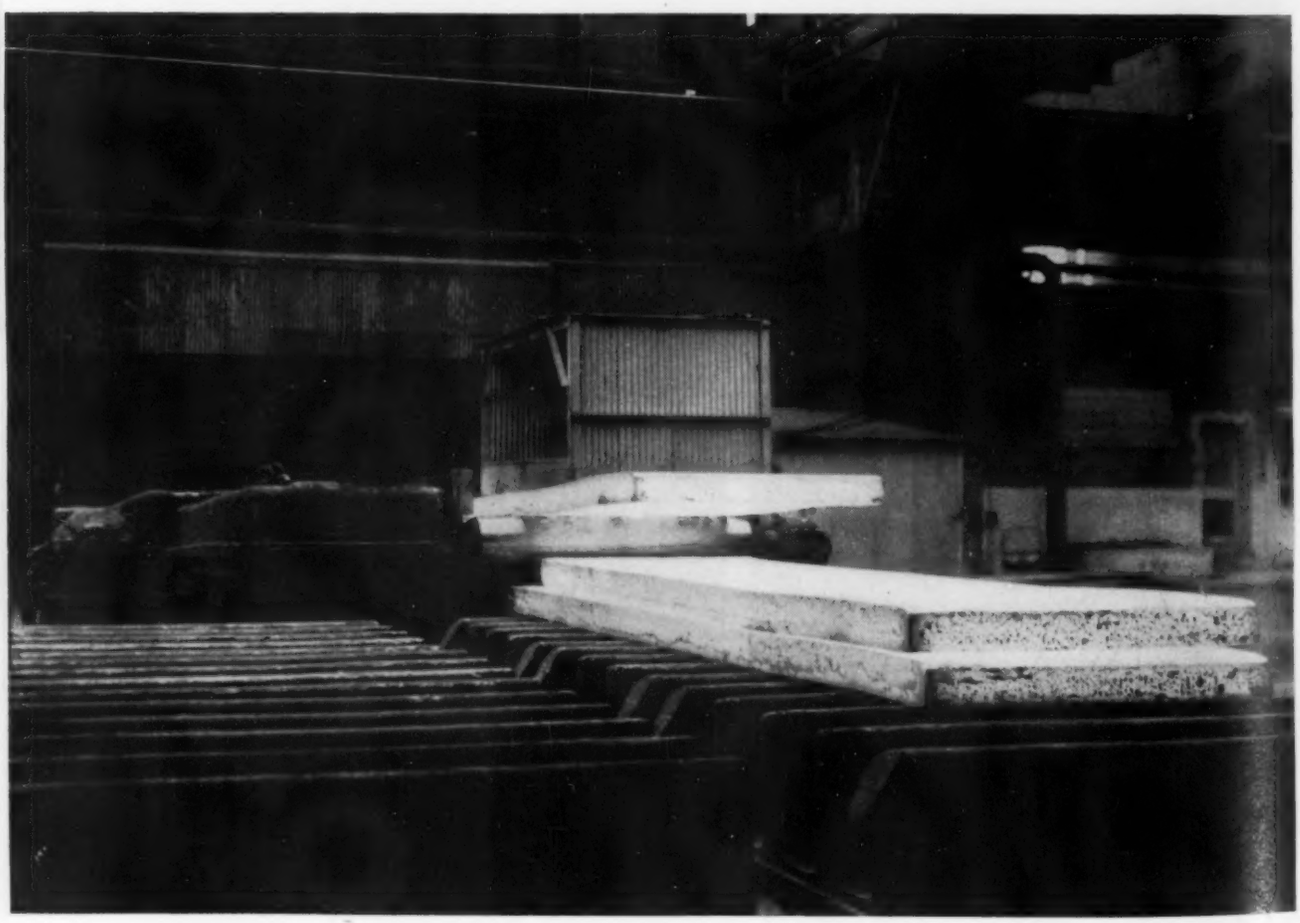
An electrically-operated depressing table, a slab-cutting gage and a crop end-removal drop table follow the crop shear. Crop ends from the new depressing table are taken to a crop loading area outside the mill via the drop table and a new crop conveyer under the roller table line. There the crop ends are cooled, then loaded into cars by magnet.

Two more new pieces of equipment facilitate removal of sheared slabs from the mill to the yard. One is a lift table and the other a twin piler table. Both are operated electrically. The piler table moves laterally to the roller-table line. When one piler table is being loaded, the other is moved into position. Two 35-hp motors power this equipment.

With the mill operating at its new output level, piling and receiving equipment now in use not only adequately handles the increased tonnage, but permits size and analysis separations when different grades of steel are rolled intermittently.

Accumulations of scale under the mill and table rollers was previously removed by sluicing with a water hose to a sump. Scale removal required a mill shutdown on each turn. Now, concrete sluice troughs covered with grating and measuring 2 ft 6 in. wide, 2 ft deep and 520 ft long are installed under the mill proper and under the table rollers from the receiving table to the table ahead of the shear. Two motor-driven pumps deliver a continual flow of water at the rate of 10,000 gpm which sluices scale and debris to a sump.

Two months after the changeover was completed, the mill averaged 1369 tons per turn as compared with a previous average of 1100 tons per turn. Moreover, it was done with a mill crew of 48 men per 24 hr compared to a previous crew of 69 men.



PILER TABLE equipment, powered by two 35-hp motors, speeds handling of extra slab tonnage to inspection and conditioning yard. While slabs are removed from one table, piler loads the second table.

*Production headaches—*

# HOW TO SOLVE FABRICATING PROBLEMS of High-Temperature Alloys

**By Hiram Brown**
Chief Metallurgist
Solar Aircraft Co.
Des Moines, Iowa

- Defects in high-temperature alloys are more critical than in standard steels . . . Laboratory tests and production results should be correlated to help ease fabrication troubles.
- Differences between vendor's and user's tests resolved by similar standards . . . Quick test for weldability has been developed . . . Don't mark these steels with lead or zinc compounds.
- Carbide networks in type 310 and similar stainless grades cause trouble in severe forming . . . Proper mill processing and heat treatment is the cure.

♦ "SUPER ALLOYS" is really a very inclusive term covering a number of alloys which are noteworthy for their resistance to heat and corrosion. They consist of stainless steels and other alloys containing high percentages of chromium, nickel, cobalt, molybdenum, etc. A list of some of the better known of these alloys is shown in the table. The very characteristics which make super alloys suitable for heat and corrosion resistance are quite often the cause of fabricating difficulties and each group of alloys also has peculiar characteristics.

The super alloys in sheet form are likely to have surface slivers or laminations, like those shown in Fig. 1, which are not only stress raisers, but can lead to failure during forming or welding. Another type of defect is demonstrated by Fig. 2 which shows a blister which did not heal during rolling operation.

Sheet is also likely to have a heavy scale pattern after descaling at the mill. In some cases this causes a surface roughness which makes resistance seam welding very erratic.

If the material successfully passes visual inspection, it is then sent to the laboratory to see whether the requirements of applicable specifications are met. These laboratory tests are not merely routine. Some of the new alloys do not act the same even in the tensile-testing machine. For example, on the first shipment of N-155 alloy, the vendor certifications were consistently showing elongation 3 to 4 pct over the 40 pct minimum elongation requirement, whereas laboratory tests showed many of these heats to have elongation values under the 40 pct minimum. Numerous rechecks at the vendor's plant and at the Solar plant showed that each reproduced his own results, which did not agree with each other. To see whether sample preparation was a factor, we exchanged specimens and still no agreement occurred. Solar and the vendor's technical representative reviewed every stage of testing. Both procedures were in agreement on everything except that the vendor was pulling specimens at 0.07 ipm all the way to fracture whereas Solar was pulling at 0.05 to 0.07 ipm to yield and then 0.5 ipm to fracture. Slower speed improved elongation

***Due to notch sensitivity, rapid work hardening specimens were carefully prepared by stamping oversize, then grinding . . .***

values for the material, although stainless steels were not similarly affected. Furthermore, the difference in speed of testing was quite marked with materials of 0.063-in. thickness, but with 0.125-in. sheet the difference was much smaller.

Shortly after this another vendor entered the field and we found that his elongation values were consistently running slightly higher than ours. Checking revealed that both were using the same testing speed, but we were using standard ½-in. wide ASTM specimens, while the vendor was using a ¾-in. wide specimen. When the vendor changed to the standard ½-in. wide specimen, the difference disappeared.

In L-605 material, we found specimens with low ductility which otherwise appeared to be satisfactory metal. Checking procedures with the vendor showed that, due to the notch sensitivity and rapid work-hardening of this metal, test specimens had to be prepared carefully. Instead of stamping out specimens to size as was the practice with stainless steels, the specimens had to be stamped oversize and then ground and polished to final dimensions. Also, the grinding and polishing had to be done longitudinally and not across the specimen.

In general, test results indicated that due to notch sensitivity and rapid work-hardening of some of these alloys, shop difficulties could be expected if parts were not carefully deburred before any welding or forming of any areas with notches or burrs. Some of the super alloys are also more sensitive to inclusions and stringers than are stainless steels. Material which under the microscope appeared to be acceptably clean, by stainless steel standards, Fig. 3, would have small splits after forming.

In many cases, such as for 310 stainless or inconel, grain-size control is also important. If grain growth occurs during annealing, orange peel may result during drawing which spoils the appearance of the part, particularly if subsequent polishing or buffing is required.

## HIGH TEMPERATURE ALLOYS

| Alloy Designation | C | Mn | Si | Cr | Ni | Co | Mo | W | Cb | Ti | N | Fe | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-9 W-Mo | 0.10 | 0.60 | 0.50 | 19.00 | 9.00 | — | 0.40 | 1.25 | 0.40 | 0.35 | — | Bal. | |
| 19-9 DL | 0.30 | 1.00 | 0.55 | 19.00 | 9.00 | — | 1.25 | 1.25 | 0.40 | 0.30 | — | Bal. | |
| 16-25-6 | 0.06 | 1.50 | 0.80 | 16.50 | 25.00 | — | 6.25 | — | — | — | 0.10 | Bal. | |
| 17-W | 0.30 | 0.60 | 1.00 | 13.00 | 20.00 | — | 0.60 | 2.25 | — | — | — | Bal. | |
| Gamma Cb | 0.40 | 1.00 | 1.00 | 15.00 | 25.00 | — | 2.00–4.00 | — | 4.00 | — | — | Bal. | |
| ATV-3 | 0.35 | 1.25 | 1.00 | 15.00 | 27.00 | — | — | 4.00 | — | — | — | Bal. | |
| CSA | 0.35 | 4.00 | 0.50 | 18.50 | 4.50 | — | 1.35 | 1.35 | 0.60 | — | — | Bal. | |
| EME | 0.10 | 0.75 | 0.50 | 19.00 | 12.00 | — | — | 3.25 | 1.25 | — | 0.15 | Bal. | |
| Low Carbon N-155 Multimet | 0.15 | 1.00 | 0.50 | 20.0 | 20.00 | 20.00 | 3.00 | 2.00 | 1.00 | — | 0.14 | Bal. | |
| Low Carbon N-153 | 0.15 | 1.50 | 0.50 | 16.00 | 15.00 | 13.00 | 3.00 | 2.00 | 1.00 | — | 0.14 | Bal. | |
| S-495 | 0.45 | 1.00 | 0.50 | 14.00 | 20.00 | — | 4.00 | 4.00 | 4.00 | — | — | Bal. | |
| S-590 | 0.45–0.40 | 1.50–0.75 | 0.50–0.65 | 20.00 | 20.00 | 20.0 | 4.00 | 4.00 | 4.00 | — | — | Bal. | |
| S-816 | 0.40 | 0.50–0.75 | 0.50–0.65 | 20.00 | 20.00 | 44.00 | 4.00 | 4.00 | 4.00 | — | — | 4.00 | |
| Discalloy | 0.04 | 0.50 | 0.50 | 13.00 | 24.50 | — | 3.00 | — | — | 2.25 | — | — | Al 0.60 |
| K-42-B | 0.05 | 0.70 | 0.40 | 18.00 | 42.00 | 22.00 | — | — | — | 2.00 | — | 13.00 | Al 0.60 |
| Refractalloy | 0.03 | 0.70 | 0.65 | 18.00 | 37.00 | 20.00 | 3.00 | — | — | 3.00 | — | Bal. | Al 0.30 |
| Inconel X | 0.04 | 0.75 | 0.50 | 14.00 | 75.00 | — | — | — | 1.00 | 3.00 | — | 6.00 | Al 0.60 |
| Inconel | 0.15 | 1.00 | 0.50 | 12.–15.00 | 75.00 | — | — | — | — | — | — | 9.00 | Cu 0.50 Max. |
| Hastelloy B | 0.05 | 0.60 | 0.25 | — | 65.00 | 29.00 | — | — | — | — | — | 4.50 | |
| Vitallium | 0.30 | 0.30 | 0.25 | 27.00 | 2.00 | 64.00 | 5.00 | — | — | — | — | 2.00 | |
| 6059 | 0.40 | 0.30 | 0.25 | 26.00 | 33.00 | 33.00 | 5.00 | — | — | — | — | 1.00 | |
| Vanadium Corp. | 0.10– | — | — | 25.00– | 20.00– | 20.00– | — | 15.00– | — | — | — | — | B 0.5–2.5 |
| NDRC Research | 0.40 | | | 35.00 | 30.00 | 30.00 | | 25.00 | | | | | |
| Climax Moly | — | — | — | 60.00 | — | — | 15.00– | — | — | — | — | 15.00– | |
| NDRC Research | | | | | | | 25.00 | | | | | 25.00 | |
| HS-23-61 | 0.40– | — | — | 28.00 | — | Bal. | — | 6.00 | — | — | — | — | |
| NR-60 | 0.50 | | | | | | | | | | | | |
| HS-30 422-19 NR-12 | 0.40–0.50 | 0.30 | 0.25 | 26.00–28.00 | 15.00–16.50 | 49.50–51.00 | 6.00 | — | — | — | — | 1.00 | |
| X-40 | 0.40–0.50 | — | — | 25.00–28.00 | 10.00–12.00 | 54.00–55.00 | — | 7.00–7.5 | — | — | — | 0.60 | |
| Hastelloy C | 0.15 | 1.00 | 1.00 | 15.00–17.00 | 55.00 | — | 17.00 | 5.00 | — | — | — | 5.00–6.00 | Al 1.0 |
| Type 410 Stainless | 0.15 | 1.00 | — | 11.5–13.5 | — | — | — | — | — | — | — | Bal. | |
| Type 347 Stainless | 0.10 | 1.50 | 0.75 | 18.00 | 10.00 | — | — | — | 0.80 | — | — | Bal. | |
| KA2S Cb | | | | | | | | | | | | | |
| KA2S Mo | 0.08 | — | 0.70 | 18.00 | 13.00 | — | 2.50 | — | — | — | — | Bal. | |
| Type 310 Stainless | 0.25 | 2.00 | 1.50 | 24.00–26.00 | 19.–22.00 | — | — | — | — | — | — | Bal. | |
| 25-ST | — | 0.4–1.2 | 0.5–1.2 | — | — | — | — | — | — | — | — | — | Cu 3.9–5.0 Bal. Al |

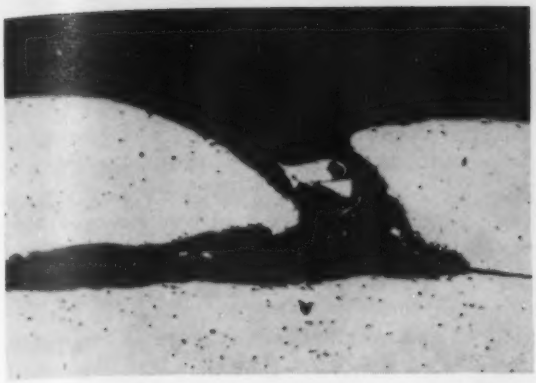


FIG. 1—Surface slivers are stress raisers which can cause failure in forming or welding. Unetched, 65X.

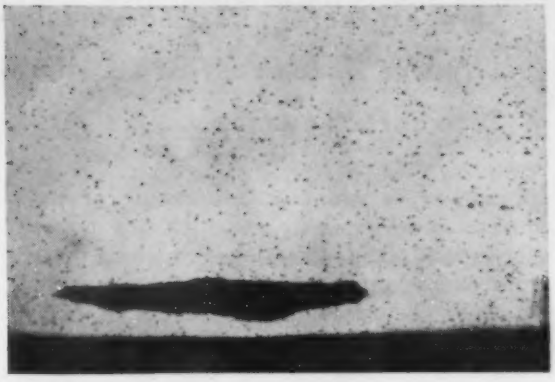


FIG. 2—Blisters which cannot be seen act in the same way as slivers. Unetched 65X.

Also, with very fine grained steel certain forming operations may result in a strain gradient which is critical for a certain temperature and germination will occur during annealing, as shown in Fig. 4. This condition may cause cracking in subsequent forming. There is also evidence to indicate that coarse-grained 310 may have lower ductility than fine-grained material in the heat range of 1200° to 1500°F. Since this is within the normal operating range in many cases, small grain size is desirable for those applications.

Sometimes alloys such as 310 stainless are received with a severe chromium-carbide network as shown in Fig. 5. This may cause fabricating difficulties where severe forming or louvering is involved. Where this carbide condition was very severe, failure of heat-treat baskets made from the material occurred after only a few days exposure to 1950°F operation as shown in Fig. 6. Normally carbide-free material lasts many times that long under the same conditions.

After the laboratory has passed the material, the troubles are not yet over. For example, N-155 and L-605 have the same specified elongation requirements, but L-605 usually gives 5 to 10 pct more elongation. However, L-605 will not form as readily as N-155 without interstage annealing and will have greater springback when formed in the same die. This appears to be connected with the fact that L-605 work-hardens much more rapidly than N-155. This occurs in bend testing where N-155 will bend more readily around a given radius without cracking than L-605.

The fact that an alloy falls within the chemical limits of the applicable specification does not always indicate that fabricating properties will be constant. This is particularly true in regard to weldability. A lot of experience with 347 and 321 showed that considerable variation in weldability occurred from heat to heat, although all heats met the specification chemical limits. The worst troubles with certain heats were: (1) cracking in the fusion welds,

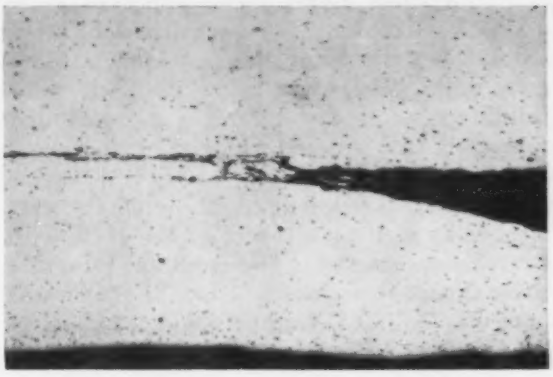


FIG. 3—Splits in super alloy develop from stringer inclusions which are of acceptable cleanliness in most standard stainless steels. Unetched 65X.

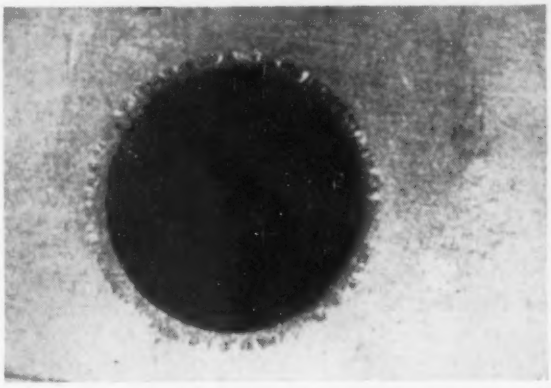


FIG. 4—Grain growth caused by annealing of an area in which cold work has been done. Etch aqua regia, 2X.

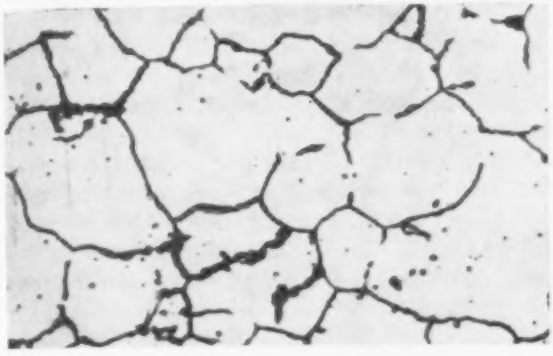


FIG. 5—Chromium carbide networks are sure to cause fabricating troubles if severe forming is involved. The above grade is 310 stainless.

***Biggest factor affecting weldability was silicon content . . . Alloys are carbon hungry . . .***

(2) sugary or granular appearance of welds as compared with shiny, smooth welds normally encountered, and (3) slower welding speeds required on automatic shielded-arc machines. At times the speed had to be cut in half to obtain sound welds.

Experimentation showed that many factors such as chrome-nickel ratio, percent ferrite in structure, etc., affected the weldability. However, the prime single factor appeared to be the silicon content. The specification range was 1.00 pct maximum with no minimum. However, when silicon was below 0.50 pct, weldability was poor. The difference in weldability characteristics between material having above 0.50 pct Si and that below 0.50 pct Si was so marked that incoming material could be quickly checked by melting a corner of the sheet with a torch and examining the resultant structure under the microscope. The effect of silicon was more marked in 347 than in 321, but establishing a silicon range of 0.5 to 1.00 pct for both alloys enabled us to obtain material which has uniform weldability and greater freedom from cracks.

**Don't even use pencil**

Most of these alloys appear to be hungry for carbon. This can lead to trouble in welding if acetylene-torch welding is used. If the flame gets too reducing in nature, the metal will pick up carbon and during pickling or exposure to corrosive agents the welds will actually disintegrate. There have been reports of carbon as high as 4 pct in the weld area. Not only are the welds susceptible to corrosive attack, but are very brittle and subject to failure under impact or shock. Gas-welding must be avoided whenever design will permit, and if it must be used then extreme care should be taken to assure that proper flame is maintained.

Markings on these alloys with regular lead pencils should be avoided since the carbon can be absorbed at that area during subsequent heat treatment and may result in etching during the pickling operation. Since zinc also has a deleterious effect on these alloys, all marking pencils or inks are checked for carbon and zinc before being approved for use. Galvanized baskets or trays should not be used to hold high-alloy parts. The mills must be cautioned against the use of zinc tags for identifying bundles of bars or sheets.

There have been strong indications that some of these alloys have hot-short ranges. In one case, N-155 parts were being formed on hydraulic presses. The parts were roughly 36 in. in diam and shaped like a shallow dishpan. After the first stage of forming, the parts were to be annealed at 2150°F. The parts were placed in the furnace before it reached 2150°F for the purpose of allowing the parts to come up to heat with the furnace. Before the furnace reached 2000°F, loud reports like rifle shots were heard. When the load was removed from the furnace 10 of the 11 parts were cracked wide open. Subsequent parts from the same run and other runs were placed in the furnace after it had reached temperature and no cracking was encountered. The conclusion was that at some temperature under 2150°F the alloy was brittle. Since stresses are finite and operate over measurable periods of time, the metal did not have enough ductility to allow the redistribution of stress and simply gave immediate relief by cracking.

Some verification of this was obtained sometime later in the welding of this same alloy. It was found that small transverse cracks appeared after shielded arcwelding; however, these cracks were in the parent metal at times ⅛ in. from the weld. Under the microscope these cracks appeared as roughly straight lines, Fig. 7, and were typical of stress cracks in that they were transcrystalline. They appeared to have been caused by a high stress with little or no ductility at the fracture. Microscopic examination showed four distinct zones, (1) the weld, (2) normal heat-affected area, (3) a change in structure different from the weld or normal heat-affected area, and (4) the parent sheet metal. In each case, the cracks appeared in this third zone.

Numerous changes in welding techniques, speed, etc., failed to correct the conditions. Special tests showed that apparently this oc-

FIG. 6—Heat-treat baskets of 310 stainless failed after a few days use due to severe carbide-network condition. Furnace temperature was 1950°F.

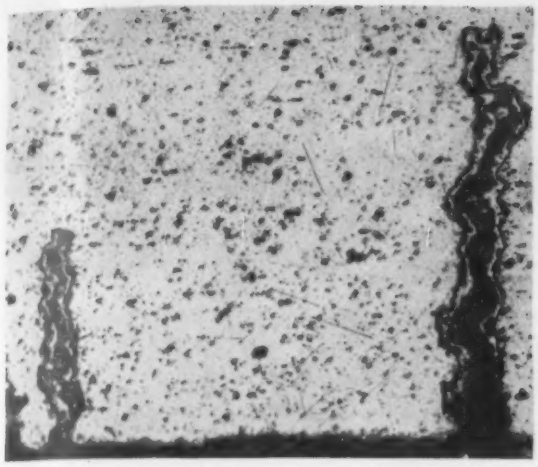


FIG. 7—Cracks developed during welding were transcrystalline, showing no ductility before fracture.

curred only when stress was in effect at the time of welding. In this case, the stress was from clamping the parts for the automatic-welding setup and the cracks came only in an area where temperature was lower than that of welding. The entire weld set-up technique was changed, and since that time no such cracking has been reported on that operation.

Some of the alloys such as Inconel X and Inconel W can be aged-hardened to obtain high strength. This material is often resistance seam welded after this treatment. Cracking is common in such cases since the weldability of such materials in the age-hardened condition is not good and fit-up is difficult due to stiffness of the aged material. Sometimes a filler of Inconel can be used to make a sandwich-type weld where the regular Inconel is between the sheets of age-hardened Inconel. The dilution from the Inconel improves weldability. Sometimes it is necessary to weld the part first and then age the assembly. Since the age-hardened materials may be welded to dissimilar metals, it is necessary to run tests to see what effect the aging temperature will have on those materials.

Even after the parts are successfully formed and welded, difficulties may arise. Usually annealing or stress-relief heat treatments are necessary. The high-temperature alloys require heat-treating at temperatures up to 2250°F. Carbide precipitation and consequent embrittlement will result in many alloys if not heated and cooled rapidly. Fig. 8 shows the effect of slow cooling on N-155 material which was properly annealed but improperly cooled. Intergranular corrosion can result from holding in the sensitizing range and then Strauss testing the part in a 10 pct Cu $So_4$, 10 pct $H_2SO_4$ solution or pickling in commercial acid.

1¼X Unetched 100X Chromic acid etch

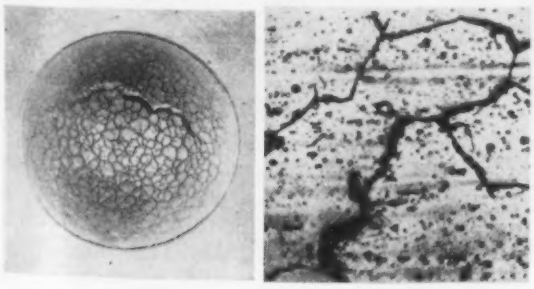


FIG. 8—Slow cooling of N-155 can produce carbide precipitation. Above material was properly annealed at 2150°F but improperly cooled.

Certain precautions must be observed. Avoid stacking parts in contact with each other. Especially avoid piling which entraps dead air, prevents circulation of heat, and tends to retard cooling. Furthermore, many of the alloys contain an appreciable percentage of molybdenum. During heat treatment at high temperatures some of the molybdenum may react to form molybdenum oxide which is quite corrosive and may react with the surface of the metal and cause pitting. To prevent this there must be adequate circulation of air around the parts, since attack is usually severe where dead-air spaces exist due to stacking of parts.

### Refractory scale formed

Heat treatment of high-temperature alloys results in a refractory scale being formed on the surface of the metal. The scale formed will vary with temperature as well as furnace atmosphere. An oxidizing atmosphere will result in a thick but loose scale which can be removed much easier than the tight, thin scale formed in a reducing atmosphere. If a number of instage anneals are used, the scale formed by oxidizing atmosphere may excessively reduce section thickness. The light, tight scale formed in a reducing atmosphere does not always have to be removed before further forming, since the scale helps retain drawing lubricant and does not harm the tools. Some companies combine procedures by using reducing atmosphere for all interstage annealing and leaving the scale on until the final anneal, at which time an oxidizing atmosphere is used to produce a loose scale and facilitate pickling.

In service, there is no need for removing a light, tight scale since it is actually a natural ceramic coating which helps to protect the metal. Many parts are used in that condition with excellent results. Where welding is to be done the scale must be removed. In general four methods of descaling are available; (1) molten caustic, (2) acids—hot or cold, (3) sand or vapor blasting, and (4) grinding. Caustic descaling is very effective for these alloys. However, its use is limited to parts which do not have open seams or joints since, if the caustic becomes trapped in those crevices, it can be very corrosive when the parts are heated in service.

*A 24-hr watch—*

# Fire Protection System

◆ Automatic fire-extinguishing system gives 24-hr protection to an expensive hydraulic scrap-metal baler, the heart of a business . . . System detects fire and sends pressurized $CO_2$ to troubled area.

◆ Pressure-operated switches close doors, stop machinery and sound alarm . . . Inert gas snuffs out blaze in few seconds, leaves no residue and does no damage to equipment.

◆ System can also be operated manually from several pull boxes. $CO_2$ is stored in twelve 75 lb cylinders.

By Morton Lissner
Lissner Iron & Metal Co.
Chicago

◆ PROTECTION OF A MACHINE against failure, damage or complete loss is vital to a business dependent almost solely on that machine for its production. The more expensive the equipment and the greater the value of output, the more important the problem becomes.

A good example of a one-machine operation is that of a scrap metal baling yard. At the 3½-acre yard of the Lissner Iron & Metal Co. in Chicago, many tons of scrap are received daily and fed into a Galland-Henning hydraulic baler valued, including the building, at about $250,000. This scrap is compressed into bales about 2 x 3 x 3 ft, then loaded into railway cars for shipment.

Loss of the baler, even for a day, would result in accumulated scrap, loss of revenue during the shutdown, plus the cost of repairing the machine. In the meantime, salaries and overhead would continue.

Fire protection for the recently-installed baler was a primary concern. Flammable grease used to lubricate the machinery and oil sprayed periodically into the compressor pit needed only an ignition source to touch off a blaze. Oil drippings which coat the walls and floor of the foundation for the equipment exaggerated the hazards. Besides these potential losses was the danger to employees.

Plans were drawn for a fire-extinguishing system which would protect three areas, the baler and pit, machinery space and control room. The system had to operate automatically, provide rapid extinguishing action, leave no residue, be a nonconductor of electricity, and use an agent which would not damage motors, electrical controls or wiring. A carbon dioxide system designed by Walter Kidde & Co., Inc., was installed.

Temperature-rate-of-rise elements are mounted throughout the three protected areas. Should a fire start, the continuing temperature rise causes the detectors to trip twelve 75-lb cylinders of pressurized carbon dioxide and turn directional valves. After a 30-sec delay, the liquid, under its own pressure, rushes through piping and discharges into the endangered space as an inert gas from multijet nozzles.

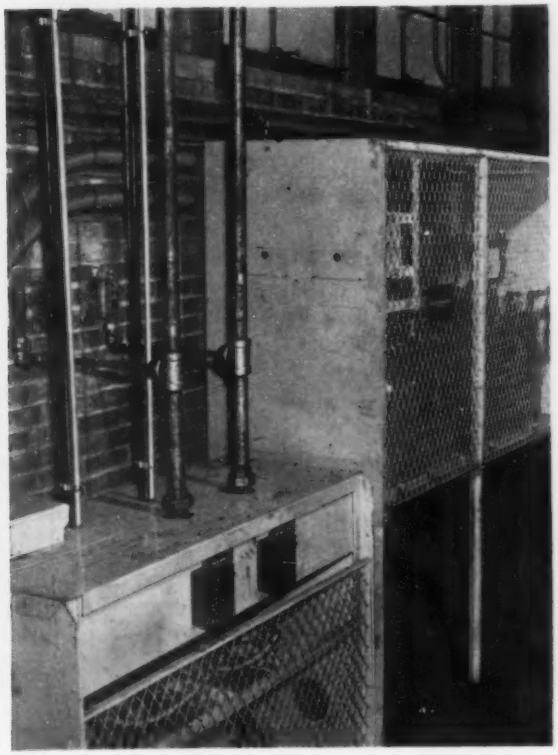
Carbon dioxide is introduced into the area in large enough volume so that the oxygen supply becomes insufficient to support combustion. As a result, a fire can be smothered in seconds. The system can also be operated manually from pull boxes at several locations.

Pressure-operated switches, which close as the carbon dioxide rushes by, are built into the piping network. When these switches operate, doors to the baler close automatically, the machinery pumps stop and a horn sounds an alarm. Fortunately, the system has not yet been called upon to quell a blaze but it continues on a 24-hr fire watch.

# GUARDS SCRAP BALER

DANGER SPOT of baler is this press pit where flammable grease and oil coat floor, walls and supports. If a blaze starts, pressurized $CO_2$ from discharge nozzles will snuff it out before serious damage occurs.

A 24-HR WATCH by an automatic $CO_2$ fire-extinguishing system protects this pump. Inert gas from multijet nozzles (shown at each side of roll-up door at right) smothers fire in a few seconds.



TWELVE CYLINDERS of liquid $CO_2$ in wire-mesh cabinet stand guard in event of fire. Direction valves (left foreground) automatically route gas through discharge nozzles (above cabinet) in danger area.

*Pressure lowers wobbling—*

# Hydraulic Lathe CUTS ROLL-MACHINING TIME

By B. A. Wilson
Consultant
Lewis Machinery Div.
Blaw-Knox Co.
Pittsburgh, Pa.

◆ Savings up to 75 pct in roll machining time are achieved with a new hydraulic lathe.

◆ Hydraulic pressure keeps cutting tool at constant pressure against the roll . . . Tool life is materially increased . . . Lateral movement of the tool permits one continuous spiral cut along an even-faced roll.

◆ RECENT SHIPMENT of a 60-in. hydraulic roll lathe to the Fairless Works of U. S. Steel at Morrisville, Pa., by Blaw-Knox Company's Lewis Machinery Div., has revealed a development that will reduce the time needed to machine rolls as well as eliminate heavy manual work formerly done by the roll turner. With this lathe, time savings up to 75 pct in roll machining have been achieved. The infeed or bit of the cutting tool, the lateral movement or traverse of the tool, and the movement of the tail stock, all are controlled by hydraulic pressure. These changes convert the roll-machining operation from a manual intermittent operation to a fairly continuous mechanical one.

On conventional roll lathes pressure is applied to the cutting tool by forcing it into the face of the revolving roll. The pressure is maintained manually by turning a feed screw. At each turn of the feed screw the pressure is suddenly increased. On the hydraulic roll lathe, hydraulic pressure forces the cutting tool against the roll at a constant and even pressure which materially increases tool life.

The earlier-type roll lathe did not have lateral or traverse movement. It employed only the plunge cut. The cutting tool was set up at one point and cut into the metal until the roll was the desired size. It was then moved over to cut at another point. With the hydraulic lathe, lateral movement of the cutting tool permits one continuous spiral cut that travels along the entire length of an even-faced roll. This eliminates set-up time. Hydraulic control makes possible the use of two or even three, tools cutting from the same side of the roll and travelling in the same direction. The traverse movement of the cutting tools can be in either direction. Hydraulically-controlled movement of the tail stock eliminates a time-consuming job that formerly required the efforts of at least two men and sometimes a crane.

On this hydraulic lathe, rolls that have a hardness up to 85 to 90 scleroscope are being machined. Formerly rolls that were above 75 scleroscope had to undergo costly rough and finish grinding operations. Most of the rolls used today are made from iron, high alloy iron, or alloy steel. All of these fall under the hardness limits that can be machined on the hydraulic lathe.

The drawing on p. 129 shows the significant features of this lathe. V's have been cut in the piano rest for the tool saddles to move on. Changes have been made in the piano rest to install a hydraulic cylinder inside. The traverse movement is accomplished by a plate on the piano rest being driven by a piston rod of the hydraulic cylinder within the piano rest. Tool saddles can be attached to any desired position on the plate. These tool saddles in turn slide in tongue and grooves on the piano rest. The traverse movement of the tool saddles, which is controlled by this hydraulic cylinder, is activated through a solenoid 4-way valve.

Separate removable hydraulic cylinders are attached on the tool saddles to control the infeeding operation. The piston cylinder forces the cutting tool into the work. The back end of piston rod is threaded, and by means of setting a nut the movement of the tool inward can be regulated and stopped at the desired point. Re-

MR. WILSON, inventor of the patented features of the new hydraulic roll lathe, is a retired Blaw-Knox development engineer. He was recalled to aid in the development of the new product.

tracting the tool can also be hydraulically controlled. A micrometer-feed valve controls the rate of infeeding. If desired, infeeding can be done without traverse movement.

The hydraulic movement of the tail stock is achieved by means of a hydraulic cylinder inside the tail stock itself. This movement can be controlled manually or by a solenoid valve.

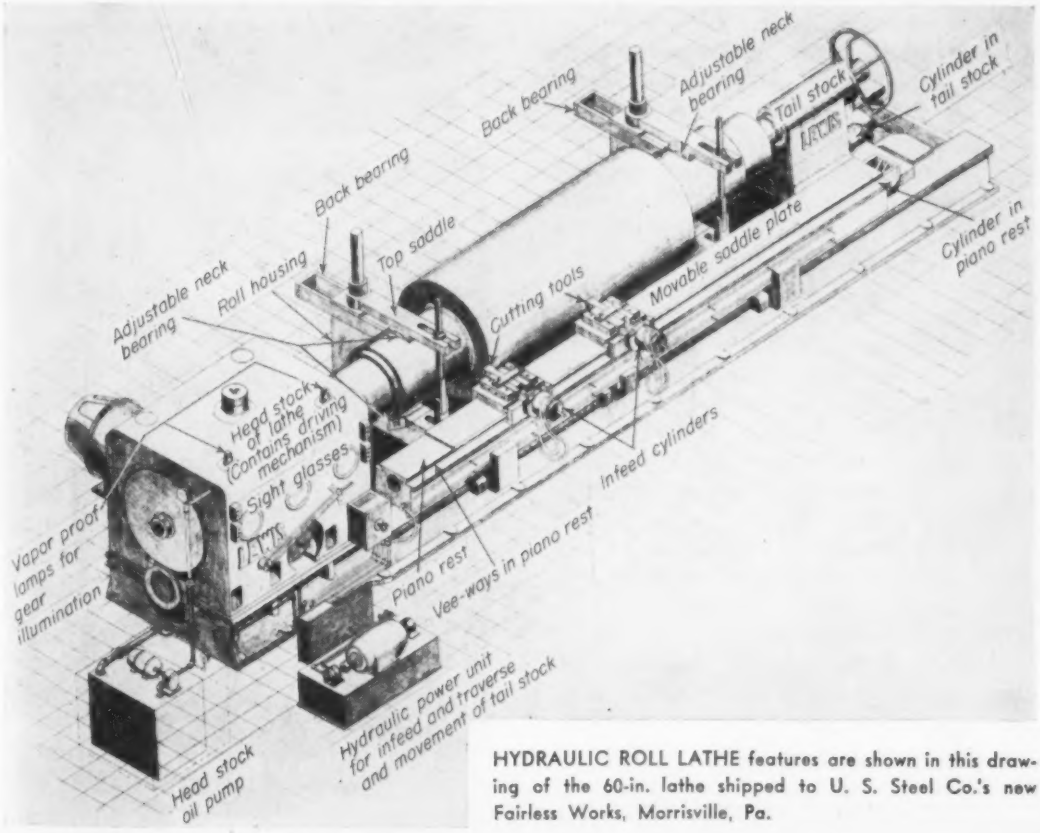
To operate these three hydraulic cylinders three pumps have been installed. A 1-gal Vicker's vane-type pump is used for the tool saddle cylinders. For the hydraulic cylinder in the piano rest two pumps have been supplied, a 4-gal Vicker's vane-type pump and a 3-gal Vicker's variable-volume piston-type pump. These pumps are designed to maintain a hydraulic pressure of 1,000 psi in each of the cylinders.

The turning or cutting speed in feet per minute varies in relation to the hardness of the metal being cut. With earlier roll lathes the cutting speed varied from 4 to 8 feet per minute. On the hydraulic lathe, speeds up to 50 fpm have been obtained using high-quality carbide tools.

A tool travel speed of 1 to 2 in. with a shallow cut of 1/64 to 1/16 in. removes the most stock and keeps the load on the motor at a high value. However, a sideways cut of ¼ to 2 in. can be made with a very slow travel speed. When a stationary plunge cut is being taken, tools as wide as 10 in. can be used. To be certain that lathe is operating at maximum output, an ammeter may be installed in the line.

The pressure used for feeding the tool into work depends upon width of the cutting edge and the kind of metal being machined. It varies from 2000 to 4000 psi of tool face. The pressure at the pump is maintained above that at the cutting tool to minimize movement or wobble of the tool. The pressure required for the traverse movement is from 10,000 to 20,000 lb. To sectionally shear or remove 1 cu. in. of metal, between 150,000 to 300,000 lb. pressure is required, depending upon the type metal. Between 0.8 and 1.6 hp is used for each cubic inch removed.

In actual operation, the tools are set in the tool saddles, one at center and the other at the end of the roll body. After the roll begins turning, a hydraulic cylinder feeds tool in 1/64 to 1/16 in. deep, depending upon the hardness of the roll. The tool travels across the face of the roll at a rate 1 to 1.5 ipr of roll. When one-half length of body face is covered by each tool, the tool is again fed in and the direction of travel reversed. This is repeated until required stock is removed. On some lathes the roll neck housings can be moved hydraulically, and set in position through the hydraulic cylinder in the tail stock.




HYDRAULIC ROLL LATHE features are shown in this drawing of the 60-in. lathe shipped to U. S. Steel Co.'s new Fairless Works, Morrisville, Pa.

*Drill striking eliminated—*

# Production Fixture INCREASES DRILL PRESS OUTPUT

By D. E. Harris
Assistant Chief Engineer
Skinner Electric Valve Div.
Skinner Chuck Co.
Norwalk, Conn.

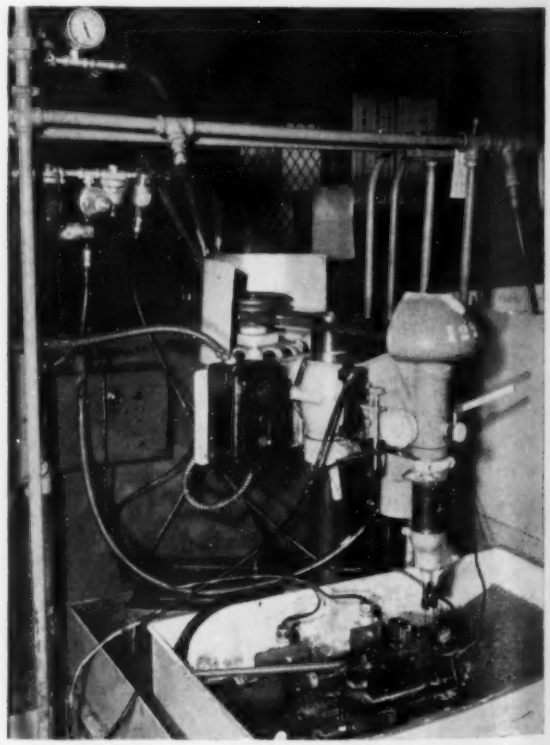
◆ A PRODUCTION FIXTURE which meets demands for increased quantity without the cost, inflexibility and time required to make use of specialized equipment has been developed by the Skinner Electric Valve Div. of Skinner Chuck Co. Drilling two holes in a steel nut with a spacing tolerance of 0.003 in. was formerly done by loading two pieces at a time into a conventional drill press fixture and using a four-spindle drilling head. Doubling lot quantities made this method too slow and magnified drill bushing wear, error in locating parts and operator fatigue.

To overcome this problem the Buffalo drill press used was modified with electrically-controlled air cylinders to power the drill feed and the work clamp. These were adapted so as not to interfere with conventional operation of the drill press on other jobs. Air controls were purchased as standard items and required little modification. An electrical control box was built using readily available components, and two standard Skinner solenoid valves were used.

In operation the nuts are placed one at a time in a short hopper which holds several pieces. The bottom piece is carried by a slide under a two-spindle drill head and clamped against a locating block. A limit switch operated by the slide at the end of its stroke operates a solenoid air valve, which in turn actuates the drill feed cylinder. When the drills reach proper depth, another limit switch causes the drill head to retract, which makes the work slide to withdraw, ejecting the finished part and engaging the next piece in the hopper. The entire operation continues automatically, the only attention needed being the loading of the hopper.

Because of the stationary position of the fixture, the common danger of striking the drills against the drill bushings has been eliminated. The use of built-in coolant and chip removing air jets has reduced maintenance. Location errors which previously occurred as a result of hand loading have been eliminated, and the operator fatigue reduced. Since controls are sequence operated without the use of timers, the speed of each air cylinder can be easily regulated by adjusting the metering pins which are incorporated in the two solenoid valves. Operation is practically foolproof, since each motion cannot start unless the previous one is completed. The safety of the operator has been assured by using a low voltage control circuit with sealed-type limit switches and by placing the loading hopper a sufficient distance from the drill head.

The new drilling method has made possible a production increase of 95 pct and an improvement in quality. The fixture has already been adapted to drilling a second part and the basic circuit and fixtures can be easily modified to machine more parts in the future.



CONTROLS AND FIXTURES used on Buffalo drill press make possible a semi-automatic operation.

**DESTINATION: BRITISH GUIANA** — Typical of Axelson foreign shipments is this crated precision gap lathe, similar to that illustrated. It is on its way to the DEMARARA BAUXITE CO., MACKENZIE, BRITISH GUIANA. But whether it's Mackenzie or Mare Island, Sao Paulo or Cincinnati, Borneo or Boston, you can't shrug off the fact that Axelson lathes are shipped all over the world in ever increasing quantities. The reason? Wherever Axelson lathes are in service, they achieve recognition for their accuracy and stability, for their precision under continuous, heavy service, as a quality tool by men demanding the utmost in metal working equipment. Send for Bulletin 5001, giving the Axelson lathe story.

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AXELSON Lathes

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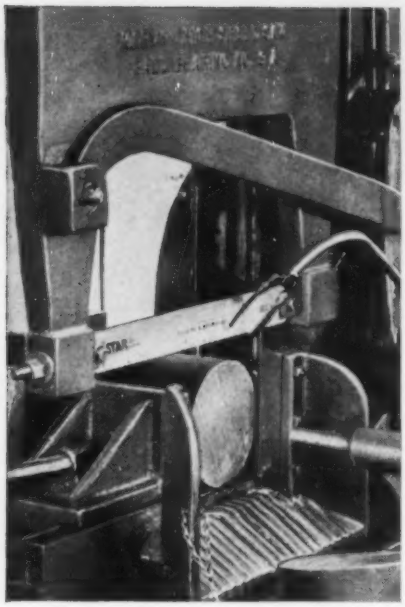

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Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines.

# Technical Briefs

Engineering

## SAMPLING METHODS:

**Method of obtaining test bars key to foundry test results.**

A foundry recently noted its carbon analyses of steel castings results were consistently higher than those obtained in its customer's laboratory.

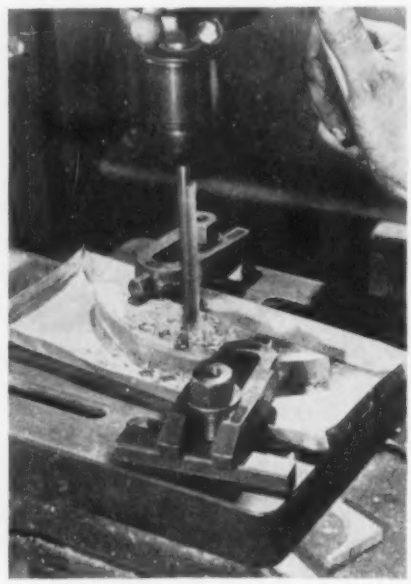
Careful and repeated checking of analytical procedures by the foundry's chemical staff failed to reveal any major sources of error. In the hope that an outsider's viewpoint would be helpful, a chemist from Sam Tour & Co., New York consultants, was called in to observe the entire analysis.

### Source Of Error

Investigation led to a survey of how the samples of the castings were obtained for analysis. Faulty techniques in obtaining sample bars were identified as the probable source of error.

Coupons from which the samples were taken were not sufficiently clean. These coupons were taken to the laboratory in the same condition as they were when removed from the mold.

In this "as is" condition—with mold sand and an oxide coating adhering to their surfaces—the coupons were taken directly to a drill press to obtain chips for the analytical samples.



METHOD of obtaining samples for test is an important factor in foundry test results.

### IF YOU WANT MORE DATA

***You may secure additional information on any item briefed in this section by using the reply card on page 87. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.***

Drillings were taken from one or several locations on the blank until a sufficient quantity of chips was obtained. Pressure was applied steadily during the entire drilling operation.

### Procedure Examined

The resulting chips were then screened, and those chips between 8 and 20 mesh were saved. The oversize chips and the fines, which included the sand and oxide coating, were discarded.

These initial steps, in which the sample was obtained by drilling with constant pressure on the drill, and screening to segregate the "proper-sized" particles, contained several major faults in the procedure.

First, when the technicians discarded the undersize chips, they not only discarded the undesired sand and oxide coating, but also, quite probably, some segregated portions and hard particles that often end up in the fines.

Samples obtained by selective screening were probably not representative of the casting. Actually, what should have been done was to remove the adhering sand and the oxide coating by grinding. Then, with these extraneous materials removed, the coupon should be drilled and all the chips obtained used for the analytical sample. Oversized chips could be broken up in a mortar.

### Suggestions On Drilling

Second, the drilling technique used to obtain the chips was improper. The steady application of pressure of the drill into the blank caused the drill to overheat, result-

ing in partially-to-badly burned chips, identifiable by discolorations ranging from straw color to dark blue. Burned chips, although acceptable for other types of determinations, should not be used for carbon analysis, since their use almost invariably produces erratic carbon results.

### Use Sharp Drills

Recommended drill speed is 250 rpm. For stainless steel, a straight, sharp double-fluted drill or carbide-tippel flat drill, should be used.

The drill should not be fed continuously into the work, but should be raised and lowered repeatedly to prevent burning of chips.

## Testing for Cracks Simplified

Location of cracks in solid materials has been simplified through use of a dye penetrant which can be sprayed on from a pressure-spray can. Developed by Magnaflux Corp., Chicago, the method simplifies inspection of local areas of large parts, or inspection of a few parts where normal testing equipment is not available.

A dye penetrant is sprayed on first. A cleaner is then sprayed on and removed with a quick wipe. An even coat of white developer is brushed on. Cracks will show up as bright red lines. Pores or leaks in tanks show as bright red spots.

SURFACE DEFECTS and cracks are readily spotted with a dye penetrant sprayed on metal from can container.

*Turn Page*

Do you have production, purchasing, stocking or delivery problems on threaded fasteners? Pheoll . . . the COMPLETE source . . . has all the answers! And here they are:

**STOCKS?** Pheoll has 'em . . . largest in the industry . . . kept up to level by perpetual inventory controls!

**TYPES AND SIZES?** Pheoll has 'em . . . the industry's *most complete line* . . . by types, head styles, finishes and sizes!

**LARGE ORDERS?** Pheoll can generally ship *immediately* on most standard types and sizes!

**STOCK INFORMATION?** Always available for immediate reply to phone calls, telegrams or letters!

**QUALITY?** Tops for 50 years . . . kept that way by constant production line and laboratory inspection!

**FAST SHIPMENT?** Yes! Efficient mechanized order-handling procedures minimize errors and hustle orders along to fast, sure completion!

In every way, *you get better service at Pheoll!* That means less work for you . . . fewer orders, reduced paper work, less follow-up, simplified stocking. Test Pheoll on your next threaded fastener requirement and see how headaches vanish!

**PHEOLL**
**MANUFACTURING COMPANY**
5700 ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

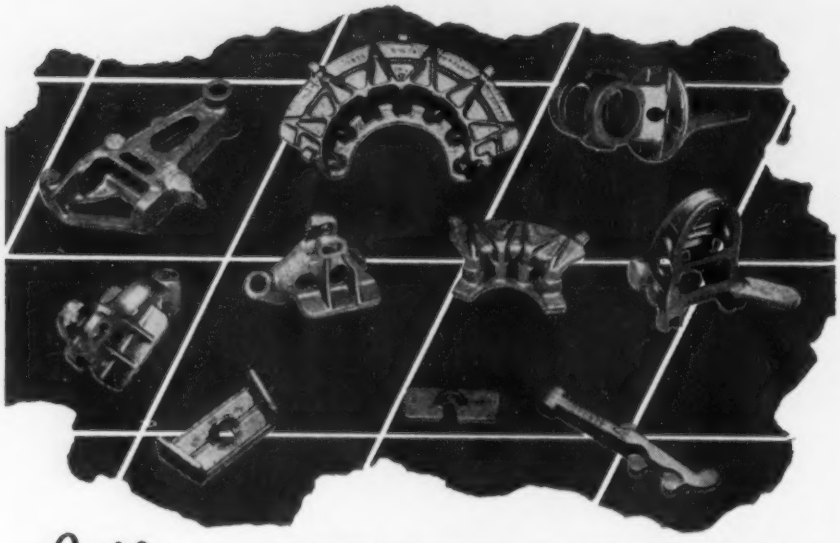
**SCREWS BOLTS NUTS**

MANUFACTURERS OF:

| | | | |
|---|---|---|---|
| Machine Screws | Socket Screws | Sems • Wood Screws | Machine Screw Nuts |
| Drive Screws | Tapping (Sheet Metal) Screws | Thumb Screws | Stove Bolt Nuts |
| Cap Screws | Threaded Rods | Stove Bolts | Slotted Nuts |
| Set Screws | Stove, Chair and Lacquer Rods | Carriage Bolts | Castellated Nuts |
| Phillips Recessed Head Screws | | Lag Bolts | Wing Nuts |
| | | Machine Bolts | Cap Nuts |
| | | Brass Washers | |

# WARPAGE? SHIFTS? DISTORTION?

**. . . Are These Tolerance Problems Causing You Unnecessary Machining Costs?**



# Call in UNITCAST!

Unitcast doesn't sit back and rest on customer praise or previous accomplishment. Mass production of Unitcastings continues to grow by leaps and bounds as *promised accuracy* continues to be an important part of each and every unit. Unitcast offers no "stock answers" for your problem. With 30 years practical "know-how" experience backed by a complete foundry engineering staff, each job is given individual attention. It only costs a three cent stamp to have Unitcast go to work on your own "tolerance headache" so why put off writing any longer?

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Give us a chance to offer a "cast steel" answer for your parts problem. Our suggestions while your product is in the design stage will pay continuous dividends.
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**UNITCASTINGS ARE FOUNDRY ENGINEERED**


## —Technical Briefs—

### PICKLE LIQUOR:

**New process recovers sulfate for reuse by steel mills.**

Development of a waste pickle liquor recovery process may point the way to savings in use of sulfuric acid at steel plants.

Invented by Dr. Othmar Ruthner of Vienna and developed by the Chemical Plants Div. of Blaw Knox Co., the process simplifies the problem of disposing of large quantities of pickle liquor.

Pickle liquor is an acid solution used to remove the scale from the surface of intermediate steel products. In the new process, spent pickle liquor is concentrated by evaporation. Ferrous sulfate is then converted to ferrous chloride by adsorption of hydrogen chloride.

#### Disposal Problem

Precipitated ferrous chloride is removed from the mother liquor by centrifugation. The regenerated sulfuric acid is returned without further processing to the pickling line. The ferrous chloride is roasted to produce hydrogen chloride for recycling to the process, and iron oxide is produced as a by-product.

With the large quantities of pickle liquor used in the steel industry, estimated at more than 600 million gal a year, the problem of disposing of this waste has become increasingly difficult and costly. For public health reasons, state governments forbid emptying waste pickle liquor into the streams.

#### Reuse for Sulfuric Acid

The process gives promise of solving the problem for the large steel producers both inexpensively and without producing other undesirable by-products which themselves might pose a disposal problem.

The entire sulfate equivalent of the waste is recovered as a reusable sulfuric acid without the installation of an expensive contact or chamber sulfuric acid plant. The iron is recovered as essentially pure iron oxide, which is recharged to the furnaces.

*Turn to Page 136*

# Cut wire fence re-coating costs!

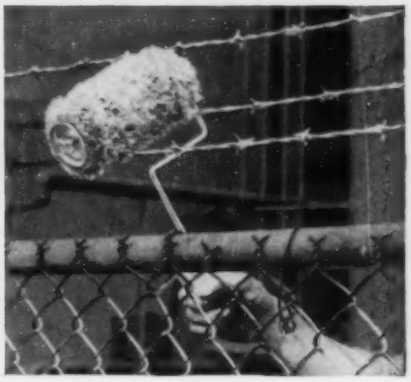
## Users Report Savings of 30% to 40% With Rust-Oleum Extra-Long Nap Lamb's Wool Roller!

Special roller glides easily over wire sections. (Rusted sections have already been primed with Rust-Oleum 769 Damp-Proof Red Primer to Stop Rust.) Finish coat is Rust-Oleum 470 R.M. Aluminum.

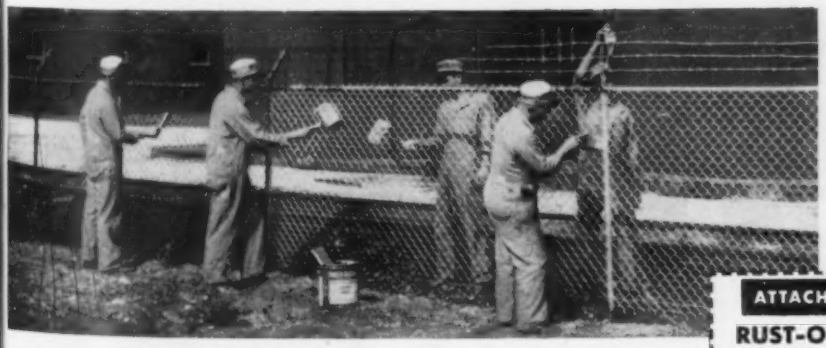
A *new, exclusive, different-type* roller! Greater diameter, specially selected skins, extra-long Lamb's Wool – all combine to give you more coverage faster and easier in the new Rust-Oleum Roller-Coating System

Close-up shows how Extra-Long Nap Wool reaches around to coat approximately 70% of other side of fence at same time. Rust-Oleum's *exclusive* penetrating qualities saturate cross wire sections for desired mil thickness.

Man follows with "dry" roller on opposite side of fence to catch and use surplus "tears" and quickly coat remaining 30% of wire sections.



Even barbed wire sections can be roller-coated in one easy pass. 99% of the material is used on the fence – *not* on the workers, *not* on the ground.



On long distances of fencing, a 5 man production "team" can achieve even greater savings. The first man wirebrushes the surface to remove dirt, dust, rust scale, etc. The second man applies Rust-Oleum liberally by roller, coating the wire sections and barbed wire. The third man follows on the opposite side of the fence with a "dry" roller to catch and use the surplus. The fourth and fifth men work on opposite sides of the fence, brushing the pipe framework and the barbed wire arms. See how this new Rust-Oleum system can save you money. Attach coupon to your letterhead, mail *today*.

**RUST-OLEUM®**

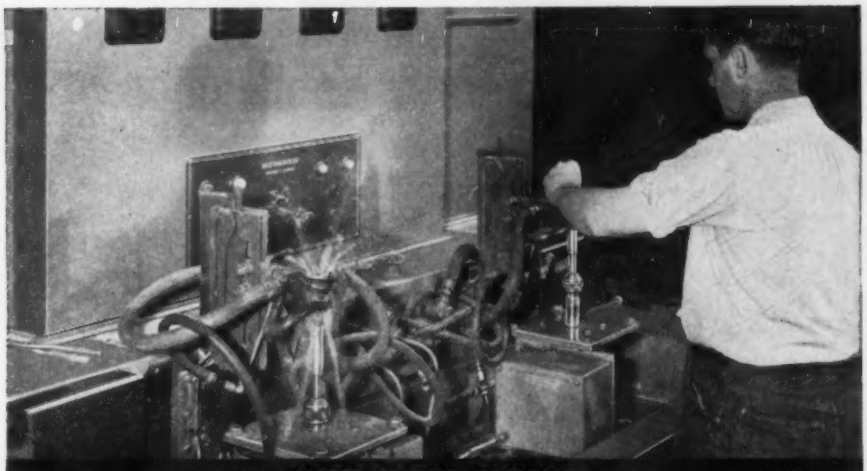
**STOPS RUST!**

**ATTACH TO YOUR LETTERHEAD – MAIL TODAY!**

**RUST-OLEUM CORPORATION**
**2561 Oakton Street, Evanston, Illinois**

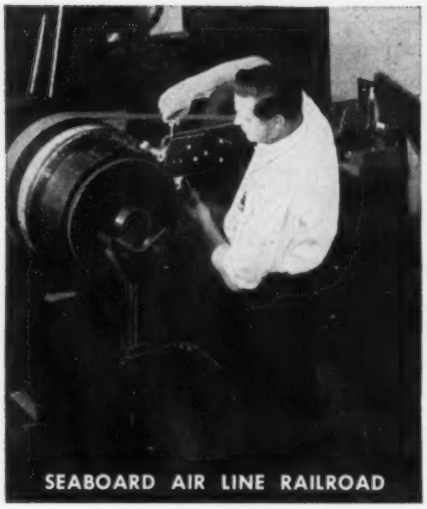
Please show us how your new Extra-Long Nap Lamb's Wool Roller will cut our wire fence re-coating costs. Include prices, complete literature about Rust-Oleum and nearest source of supply. We have approximately_____ yards of wire fencing.

# Industries

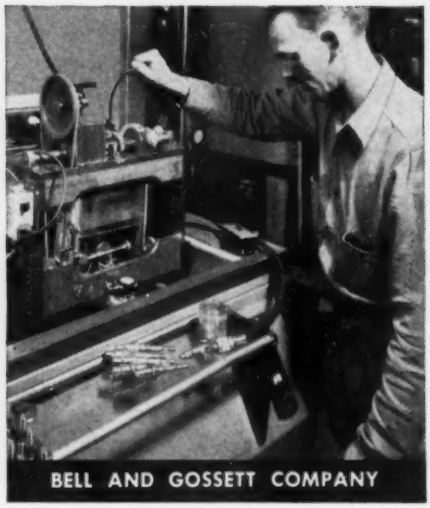


MASSEY-HARRIS COMPANY

# across the nation



SEABOARD AIR LINE RAILROAD



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## UP Production with Westinghouse Induction Heating

Production rates upped by 50% to 2000%! Time savings up to 80%! Space savings up to 90%! Figures like these in company after company tell the Westinghouse story. Across the nation, Westinghouse installations are saving time and money—and doing a better job to boot!

What is your heat-treating problem? Hardening? Annealing? Heating? Metal Joining? Westinghouse Induction Heating may be the answer.

For full information write: Westinghouse Electric Corporation, Electronics Division, Department 62-2, 2519 Wilkens Avenue, Baltimore, Maryland.

YOU CAN BE SURE...IF IT'S Westinghouse

J-02262


## —Technical Briefs—

### MATERIALS:

**Electrical, chemical industries require smaller pressure tubing.**

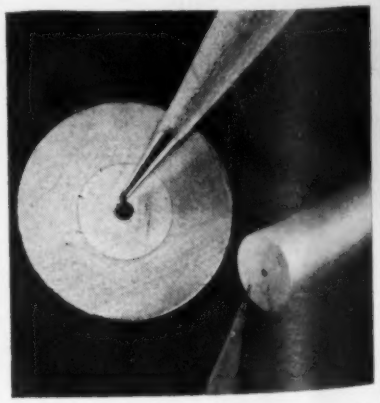
Expansion of the electrical and chemical industries in recent years has spurred demands for small pressure tubing. Pointing up the variety of types of fine, pressure tubing developed to meet this growing market, will be an exhibit of pressure tubing to be shown at the Basic Materials for Industry Exposition, New York, June 15 to 19.

Sponsored by Superior Tube Co., Norristown, Pa., the exhibit will show representative samples of tubing for the aircraft, diesel, electronics, chemical and metalworking industries.

#### Drawn from Titanium

Of special interest will be the exhibit of commercially pure and alloy titanium tubing. Included will be samples of the smallest size tubing ever drawn from commercially pure titanium tubing: outside diameter is only 0.0455 in.; wall thickness is .00225 in. At present, this tubing is used for experimental work in the electrical, electronic and chemical industries.

The titanium tubing is produced commercially in sizes from ⅛ in. to ½ in. OD, with wall thickness from 0.004 in. to 0.187 in. Titanium tubing is finding increasing application in the processing, pharmaceutical and aircraft industries, where its corrosion resistance, light weight and high strength solve many design problems.



SUPER PRESSURE TUBING has two walls. Tubing is made by drawing two thinner-walled tubes over each other.

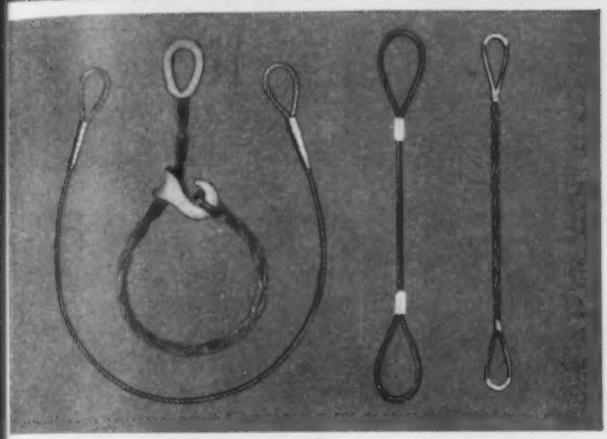
*Turn Page*

PREFORMED INTERNALLY LUBRICATED

# Wire Rope

**for cranes, hoists, elevators, and all equipment**

From Macwhyte's complete line of a thousand and one sizes and types, you get the right rope for your equipment. Thoroughly lubricated, PREformed, engineered to give long, low-cost service. *Send for Catalog G-15.*

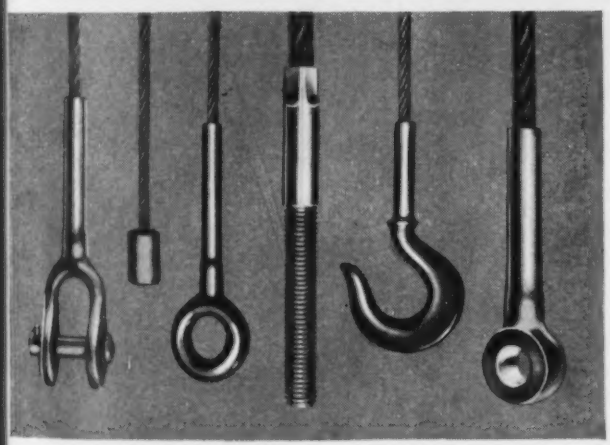


WIRE ROPE

# Slings

**for lifting and moving materials, equipment in production or maintenance**

There are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. *Send for Catalog S-8.*



WIRE ROPE

# Assemblies

**for machine parts, controls, and operating devices**

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. *Send for Catalog 5201.*

# MACWHYTE

1028-SW

**These catalogs available on request**

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# with a *Wheelabrator*®

In just 12 seconds, badly rusted and corroded steel drums are cleaned to the virgin metal with Wheelabrator airless abrasive blast cleaning equipment at a drum reconditioning plant. In its water meter rebuilding program, one large meter repair company cut its cleaning costs 75% with a Wheelabrator. 70 connecting rods are cleaned in 4 minutes, a savings of 2½ hours, in a reconditioning operation at an automotive service company. Other items profitably cleaned with the Wheelabrator in reconditioning operations include gas cylinders and meters, railroad diesel engine armatures, floor maintenance machines, fabricated steel members and structural steel, etc.

Wheelabrator cleaning, which economically removes all scale, rust and corrosion right down to the virgin metal, can save money for you, too, in your metal cleaning operations. *Write today for complete details.*

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Wheelabrator®
AIRLESS BLAST CLEANING




## RIVETING:

**Blind riveting simplified with English "pop" rivet.**

Riveting in a blind corner where a bucking bar cannot be used has long plagued riveters. A new answer to this old problem is a "pop" rivet which can be worked from one side and requires no bucking bar.

Made in Monel and aluminum, the rivet was developed in England by the Geo. Tucker Eyelet Co., Ltd., and introduced by J. C. Rhodes & Co., branch of United Shoe Machinery Corp., New Bedford, Mass.

### Rivet and Mandrel

Deep-drawn from strip stock, the "pop" rivet can be used to fasten most commercialy available metals and alloys. The fastener consists of the rivet and an inserted mandrel of high-strength

RIVETS are first inserted in tool. Both power driven and lever operated hand tools can be used.

PREDRILLED HOLES are easily loaded with rivets. Operation simplifies riveting of blind holes where backup bar cannot be used.

steel. The mandrel looks like a finishing nail.

The mandrel, with attached rivet, is slipped either into predrilled holes in the work to be fastened, or into the fastening tool and then into the hole. Fastening tools can be operated manually and pneumatically.

In operation, the collet of the tool grips the shank of the mandrel and pulls while the nose of the tool presses firmly against the head of the rivet and holds it clamped tightly against the face of the section to be fastened. Simultaneously, the collet pulls the shank of the mandrel, thus expanding the inside end of the rivet to fasten it tightly against the inside surface of the work.

### Draws Work Together

This action draws the sections of the work firmly together and clinches them in positon. The mandrel is designed so the head will break when the expansion has reached a point sufficient to provide maximum holding powers. The head then falls off and the shank is pulled through the rivet. If preferred, the mandrel head may be retained in the end of the rivet, through the use of the break stem type of mandrel.

Where necessary, the hollow rivet can be filled with a compound or capped.

In Great Britain, the "pop" rivets have been used on airplanes, truck bodies, cooking ranges, passenger automobiles, refrigerators, railroad coaches, roofing.

HOLLOW RIVETS can be made leakproof under normal atmospheric pressures by use of permanent cap.

*Turn Page*

# DYNAMIC STRAINS
## Quickly Recorded

● In this test on operating tractor parts at Caterpillar Tractor Company, strains are "picked up" with resistance-sensitive strain gages. The signal is then amplified and recorded — *instantaneously* — by the Brush Analyzer.

Such immediate strain recording saves engineering time, and eliminates laborious plotting of data. The written records provide a permanent history of tests. This simplified measurement is a boon to product development.

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There are other brands of materials that resemble Roto-Finish chips and compounds . . . but only Roto-Finish chips and compounds give you the *extra advantage* of continuous research by the company who originated the Roto-Finish processes. Roto-Finish chips and compounds are carefully manufactured so *you* obtain the best results on *your specific job*. To obtain the best results at the lowest cost . . . insist on ROTO-FINISH chips and compounds.

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Put the experience and facilities of Roto-Finish to work for you on *your special finishing problems.*

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## CORROSION:

**Aluminum's self-stopping nature slows down metal loss.**

In a 20-year corrosion study on aluminum—the longest and most intensive analysis of its kind ever made—the metal has achieved a new record in withstanding atmospheric weathering and corrosion.

Results of the study were presented in two papers at the recent Chicago meeting of the National Assn. of Corrosion Engineers.

Service installations of aluminum exposed to the atmosphere as long as 52 years were covered in the research findings. Controlled test specimens have been exposed at weathering stations for as long as 20 years.

### Self-Stopping Characteristics

Aluminum alloys are highly resistant to corrosion after such long periods of exposure, the report showed. Aiming particularly toward architectural and structural uses of aluminum, the report brought out aluminum's self-stopping characteristics. This is its tendency to reduce the rate of weathering to a minimum after an initial exposure period.

Data indicate that after an initial exposure period of about 1 or 2 years, the maximum rate of penetration of corrosion is expected to be appreciably less than 0.2 mil per year for the more adverse conditions, such as severe seacoast atmospheres, and less than 0.1 mil per year for atmospheric weathering conditions normally encountered, the report stated.

## Preheats Blast Furnace Air Fast

An improved stationary-bed type of pebble stove—used to preheat air before blowing it into an experimental blast furnace—at temperatures reaching 2300°F, is described in a recent Bureau of Mines report. The improved stove is one of the most direct and economical devices for reaching such high temperatures rapidly and without damaging retort walls, the report points out. The model, designed and built by the Bureau, involves an automatic reversing of the air stream by thermal control.

## GRINDING:

**Gas turbine buckets and blades contoured on new belt machines.**

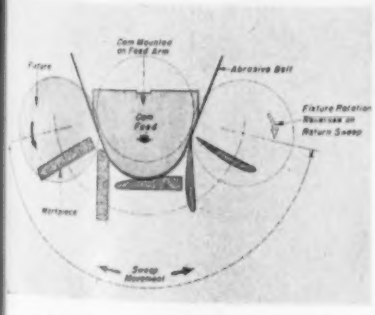
Grinding of buckets and blades for some aircraft gas turbine engines has been simplified with two new belt grinders developed by Planet Products Corp., Cincinnati, Metcut Research Associates, Cleveland, and the Metals Processing Div., Curtiss-Wright Corp., Buffalo.

Tooled for Sapphire turbine rotor and stator parts, the machines remove stock from one side of blades at a rate of .001 to .003 ips. An average cycle time of less than 1 minute per side can be obtained with usual stock allowance. An 80-grit belt has been used on the rough or "semi-precision" Nimonic (about 80 pct Ni) forgings to produce approximately a 50 microinch finish. Depending on material and stock-removal requirements, tests have indicated that almost any degree of finish can be obtained.

### Use Master Forms

An abrasive belt travels between a master form and the work piece. The master form generates the desired contour as a result of the specific relative motion between it and the work piece. A 15 hp motor supplies ample power for rapid metal removal.

Shape of the master form for each job is determined on the grinder. A master blade or bucket is placed in position on the machine, supported in the same way as in the actual engine, when possible. A blank faced with plastic




BASIC MOTION required to generate a simple airfoil shape. Center circle represents gear in fixed position on axis of sweep arm. Outer circles represent planet gear positions at opposite ends of sweep motion.

*Turn Page*


# TWO MILLION WITHOUT A FAILURE!

**parts:** small connecting rods

**alloy:** "600" series metal, a high strength bearing bronze that contains no tin

**quantity to date:** over 2,000,000

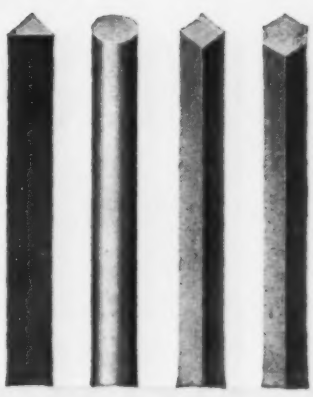
**number of failures:** none

**forged by:** Mueller Brass Co.

**advantages:** no bearing insert is necessary on either the wrist pin or crankshaft end because each rod acts as its own bearing. Dense homogeneous grain structure, close dimensional tolerances and high mechanical properties often permit redesigning for weight savings as high as 15% to 25%. "600" alloys have low coefficient of friction, high resistance to corrosion and tensile strength 2½ times greater than cast phosphor bronzes.

**uses:** compressors, outboard motors, small high speed gasoline engines. Best results are obtained if they operate against hardened, ground and polished shafts.

**"600" SERIES ROD** is produced in standard 12-ft. mill lengths and a wide range of sizes and special shapes. This rod has a fine, uniform grain structure and the mechanical properties are rigidly controlled in the cold drawing process. Scrap loss is greatly reduced in machining operations because of the complete absence of defects. For complete information, write us today.



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# F.O.B. MADISON, WISCONSIN...

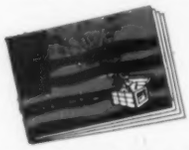
## packing time cut 60%
## materials cost cut 17%
## shipping weight cut 9%

### With General Engineered Containers

Wherever these giant cylindrical pressure sterilizers are going, it costs less to ship them. General container engineering cut material cost $2.00, saved 70 minutes packing time and reduced shipping weight 42 lbs. on this hard-to-pack item . . . and this is only 1 of 12 cost-cutting containers we have helped to create for Ohio Chemical and Surgical Equipment (a Division of Air Reduction Company, Inc.) since 1949.

Whatever your packaging problem, military or civilian, General Box Company's two fine packaging laboratories and trained packaging experts stand ready to help you solve it. Find out how *you* can cut costs. Write for complete details.

***Find out how other manufacturers are cutting container costs. Write for your free copy of "The General Box."***



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1873 Miner St.
Des Plaines, Ill.

*Factories:* Cincinnati, Denville, N. J., Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, Prescott, Ark., Sheboygan, Winchendon, Mass., General Box Company of Mississippi, Meridian, Miss., Continental Box Company, Inc., Houston.

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• Cleated Corrugated and Watkins-Type Boxes • All-Bound Boxes • Corrugated Boxes




material is inserted into the conjugate form position.

Power sweep motion is used with hand feed control so that the master blade generates its own conjugate form in the plastic. The master form is reproduced in steel and hardened, then either surface treated or plated to improve wear resistance.

### Hard Chrome Plated

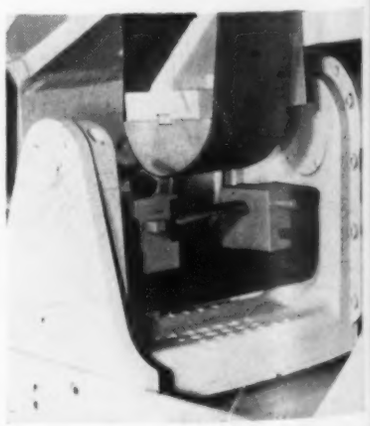
In use, the form is checked at regular intervals to determine when the plating, usually hard chrome, is beginning to wear through. At this point the chrome is stripped and the form replated.

The method permits rapid stock removal to produce the required contours. Comparatively rough work pieces can be used in place of forgings and castings. Objectionable skin effects encountered on some forgings and castings are eliminated.

There are two models, one for concave shapes, and one for convex and relatively flat surfaces. It is possible on some of the comparatively flat blades (many compressor blades, for example) to grind one side of the blade and one-half of the leading and trailing edges in one setting on the convex grinder. A blade of this type can be ground complete (except for root contours) in two handlings.

### Automatic Cycle

Once the machines are set up, the operator loads a work piece,



AIRFOIL SECTION in position prior to start of grinding operation. Tip of work piece is supported by chisel point which is applied and released with light impact blow.

an ACCO product

WIRE

ROUND

FLAT OR SHAPED

PAGE

makes them all...

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

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SWEEP ASSEMBLY, at extreme end of one sweep, shows coolant delivery holes. Coolant supplied through passages in sweep arm solves problem of flooding moving work piece.

presses the master cycle button. Operation is automatic to the point of removing the finished piece and inserting a new one.

Operating cycle includes: Rapid approach to an adjustable point; rapid feed to remove high points on the work piece; slow feed for bulk of stock removal; adjustable tarry time to insure proper spark out; rapid return.

Base of the machine is used as a coolant tank. A large door provides access for belt-changing and setting up. A smaller plastic sliding door is used for loading and unloading work pieces. Both doors must be closed for the machine to operate.

### Many Contours Possible

A variety of relatively flat shapes (concave and convex) ranging to extremely convex forms can be generated.

The master form in one model is supported on a feed arm. This arm is actuated by a hydraulic cylinder providing rapid approach up to the point where it contacts an escapement device. The cylinder then powers the feeding portion of the cycle.

Feed mechanism is arranged so that slow feeds can be obtained without metering critically small quantities of oil from the feed cylinder. Adjustments for size can be made while the machine is running.

Sweep unit of the convex ma-

*Turn Page*

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of this versatile steel. 52100 is hard, tough and long-wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

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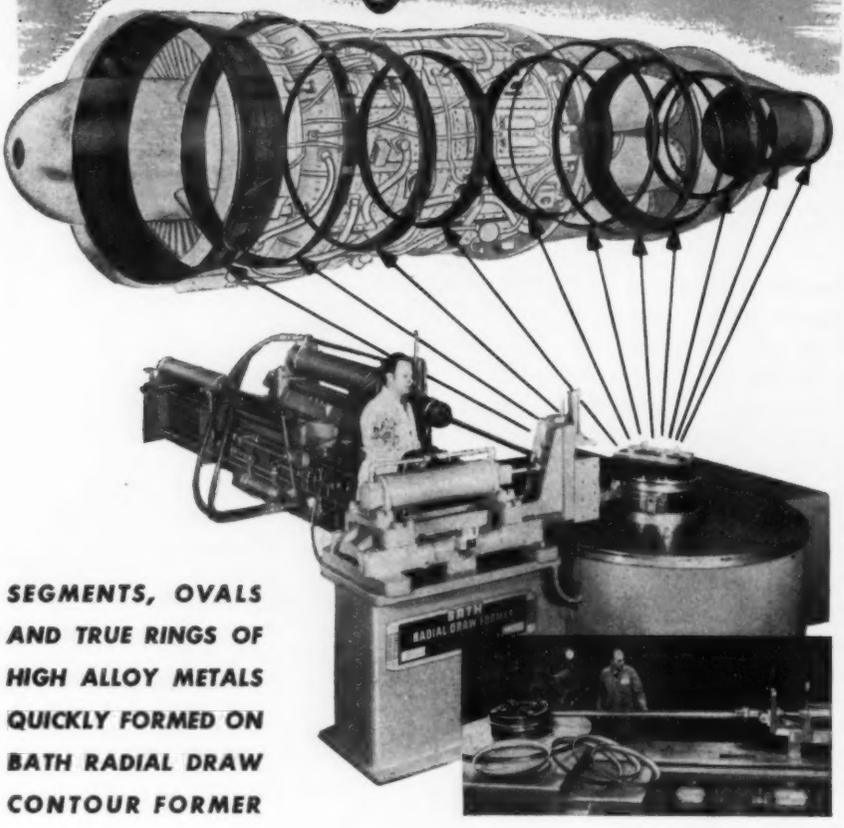
# ADVANCED TECHNIQUE in Jet Ring Production




***SEGMENTS, OVALS AND TRUE RINGS OF HIGH ALLOY METALS QUICKLY FORMED ON BATH RADIAL DRAW CONTOUR FORMER***

**Far ahead of the field in design concept, the BATH RADIAL DRAW CONTOUR FORMER will form turbo-jet compressor and afterburner members, guided missile rings and aircraft wing and fuselage sections of variable contour and cross sections. The rings and parts are true and within the precision tolerances demanded of aircraft components.**

**BATH RADIAL DRAW FORMING shows more pounds of critical material and weight saved per 1000 pounds of engine thrust than any other forming method.**

**Recognized as fast and efficient, it has been accepted as a development of vital importance in U. S. armament programs. Forming facilities are available, send prints for quotes.**

*Machine capacities from 12½ to 200 tons in standard Models. Write for catalog CF-352.*

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chine carries a cradle upon which the work-holding fixture is mounted. The oscillating planetary motion of the work piece against the master form (with the belt moving in between) enables grinding of the desired conjugate contour. Both the master form and the work-holding cradle are easily removed and tooling is interchangeable between machines.

### Constant Belt Loading

To insure constant belt loading, the tensioning pulley is hydraulically loaded. A limit switch stops the machine if the belt breaks. Idler pulleys are adjustable for direction of tilt, angle of tilt and axial position—all independently.

## ORE CARS:

**Shorter ore car saves space in yards . . . Unloads fast.**

A new type of ore car recently placed in service by the Bessemer & Lake Erie R. R. features refinements in design and construction that assure nearly 50 pct saving over conventional 70-ton and 90-ton hopper cars in yard track space, allow bottom unloading through a trestle, provide easy handling in a car dumper, and facilitate ore-thawing.

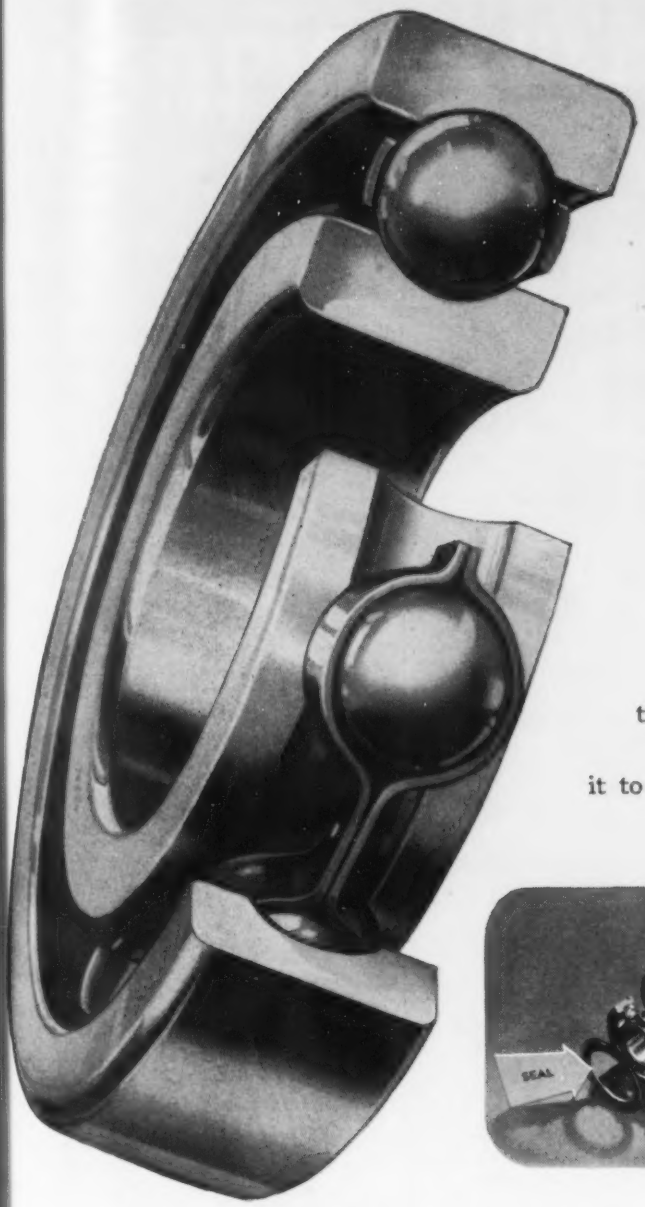
Greenville Steel Car Co., subsidiary of Pittsburgh Forgings Co., has built 500 of these 70-ton capacity all-steel ore cars for the Bessemer & Lake Erie R. R. Co. at its plant in Greenville, Pa. Basically a design of the Mesabi standard ore car used in short-route service, the new cars are new engaged in mainline long-haul transportation of iron ore and limestone.

### Safety Feature

A feature of the new car is the bottom door opening. Doors are hinged at the side sill to open outward and downward in order to place the lading directly between the rails. Apron plates prevent the ore from spilling over the end of the doors. These hopper doors clear the rail when open, and close together at center line of car.

The door mechanism is operated

*Turn to Page 146*



## where shafts must turn fast you'll find SKF SINGLE ROW DEEP GROOVE BALL BEARINGS

Look at the *contact* between the balls and the deep, continuous groove in each ring of this SKF bearing—contact that enables it to sustain not only radial load, but substantial thrust load, even at very high speeds.

Look further—SKF Single Row Deep Groove Ball Bearings are available with *any combination* of DuPont Fairprene seals, shields and snap rings: shields for excluding dirt; seals for retaining lubricant; snap rings for holding the bearing in lateral position in its housing.

Like all SKF Bearings, they're held well within established tolerance limits, tested for radial runout, carefully cleaned, protected from rust, strongly packaged.

Many SKF bearings are serving industry everywhere because SKF's unmatched Field and Home Office engineering service helped product designers *put the right bearing in the right place.* **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA. *—manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

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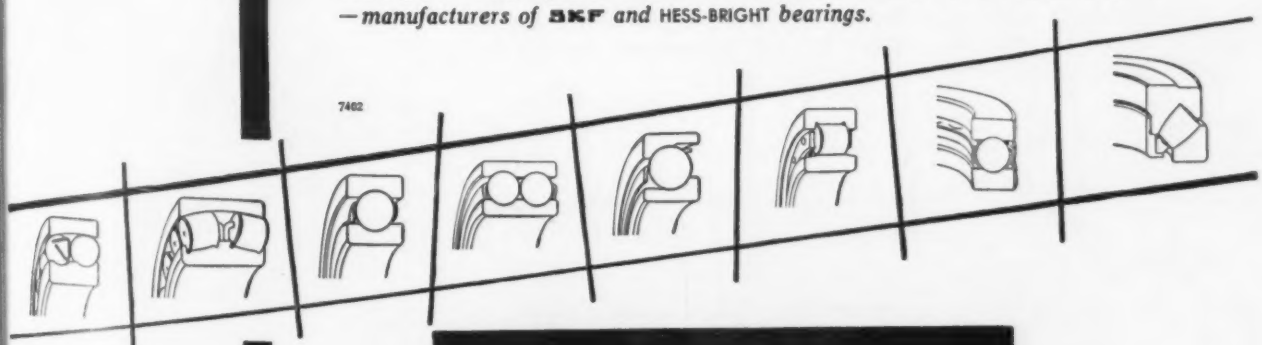
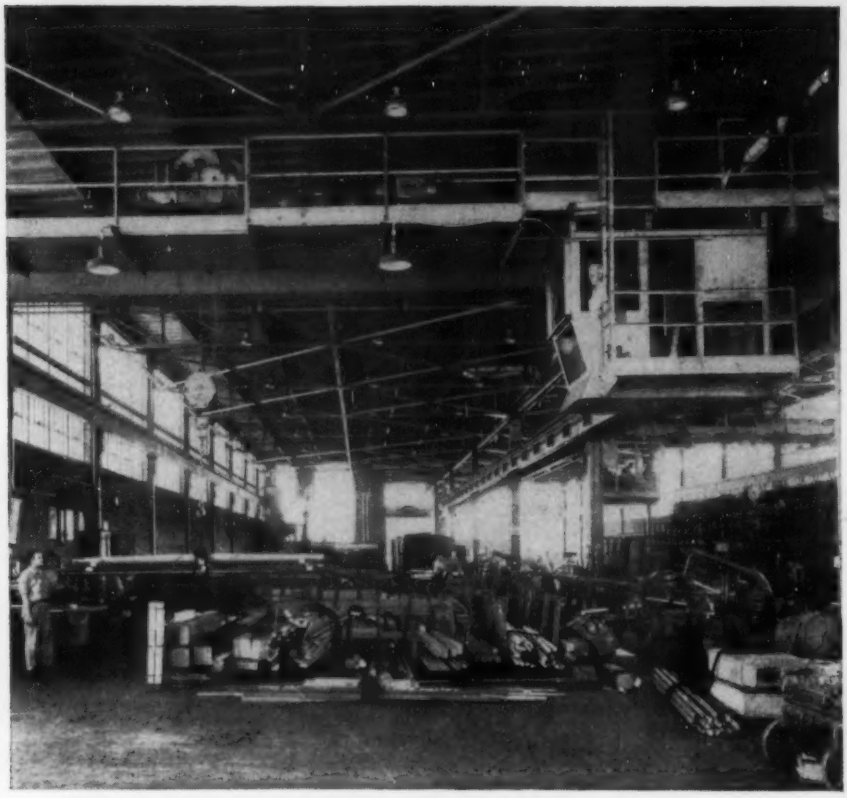


**SKF**'S COMPLETE LINE OF ANTI-FRICTION BEARINGS, PLUS **SKF** ENGINEERING CO-OPERATION, HELPS YOU PUT *THE RIGHT BEARING IN THE RIGHT PLACE.*

**SKF**®
BALL AND ROLLER BEARINGS

# SHEPARD NILES CRANE

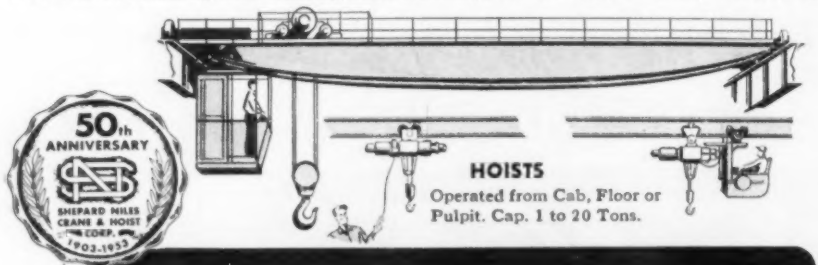


# FREES FLOOR SPACE for production & storage

Why waste space that's suitable for production or storage on floor-level systems of handling! Let a Shepard Niles Crane put unused ceilings to work—you'll speed production, eliminate re-handling, move heaviest loads safely, at low cost.

Thrifty through-the-air handling can make more space in your plant. But be sure you choose the right crane! Ask the Shepard Niles representative to show you data on installations similar to yours—help you select the correct equipment. Write today for Bulletin describing Shepard Niles Cranes—and arrange to have a representative call.

**CRANES**
Overhead: Top Running, Inner Running, Under Running, Floor or Cab Operated. Cap. 1 to 450 Tons.




**HOISTS**
Operated from Cab, Floor or Pulpit. Cap. 1 to 20 Tons.

**SHEPARD NILES**
CRANE AND HOIST CORPORATION

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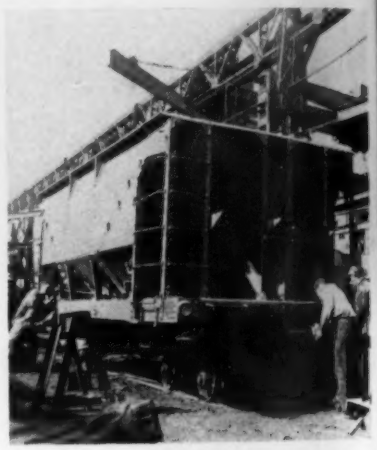
with a 4-to-1 ratio. A pinion in the gear allows one man to safely open or close the doors from either side of the car. Safety is assured by clutch collars that form a "lost motion" device so the operator creates his own safety factor before tripping the load.

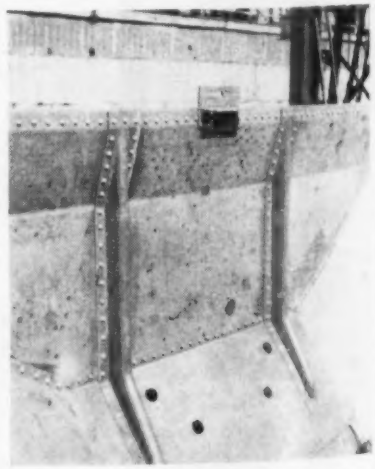
### Fast Thaw With Steam

The bottom or floor sheets are constructed to provide a 50° slope, 20° steeper than the floors of ordinary hopper cars, which insures the lading flowing out when the doors are opened. It will depend, of course, on the weather and condition of ore, whether it is wet or dry, as to how fast it will flow.

During freezing weather pipes



NEAR COMPLETION on building tracks of Greenville Steel Car Co., Greenville, Pa., is this new 70-ton ore car for Bessemer & Lake Erie R.R. Co. Production rate is 10 cars per day.



FOUR POKE HOLES in slope sheet of ore car permit use of steam jets when thawing is necessary. Seventy cars can be thawed every 3 hr in cuts of 35 cars each on parallel tracks.

*Turn to Page 148*

# STOP CORROSION

with corrosion resistant fastenings by

## HARPER

The cancer of corrosion is constantly at work, eating away the life of the equipment you manufacture. The H. M. Harper Company specializes in "Everlasting Fastenings" to combat corrosion. Bolts—nuts—screws—rivets—studs—washers of brass—naval bronze—silicon bronze—Monel—nickel—copper—aluminum—stainless steel—and the newer high temperature alloys.

Skilled engineers and metallurgists, backed by 30 years of experience, are available to work with you on the design and production of fastenings to solve the tough corrosion and assembly problems you may be facing.

In every market area, you will find Harper Branch Offices and Distributors ready to give you prompt service. Over 7,000 items are carried in stock, making it possible for you to fill all your requirements from one source, bringing you these advantages—one order to write—one account to keep—one bill to pay.

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Markal Paintstiks are a quality product that produce permanent markings—made especially to meet the needs and special conditions of industry.

Write today for an easy selector chart, then order Paintstiks from your nearest jobber. If he should not have them write direct to the address below.

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are inserted into the frozen ore through holes provided in the slope sheets and live steam turned into the frozen mass to thaw it for dumping.

Each new ore car is only 27 ft 2 in. when coupled. A train of 100 cars will occupy only 2717 ft of track space as contrasted to 4417 ft required for a train of 100 all-purpose 70-ton hoppers. The short coupled car is an advantage especially in the steel mill yards where track space is limited. Each car has a capacity of 1096 cu ft level full.

## DESIGN:

**Analog computers boon to makers of modern regulating equipment.**

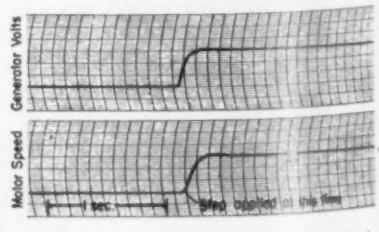
Designing regulator systems and components to meet a wide combination of mill conditions can best be done by using computers to determine the performance of new circuits before they are built, according to J. T. Carleton, supervisor of analog computer operations, Westinghouse Electric Corp., Pittsburgh.

Impetus for improvements has come from the demands of industry for more production from a given amount of equipment, and for the maintenance of closer tolerances of the product. These conflicting demands can be met by improved performance on the part of the regulator.

### Speed Control Important

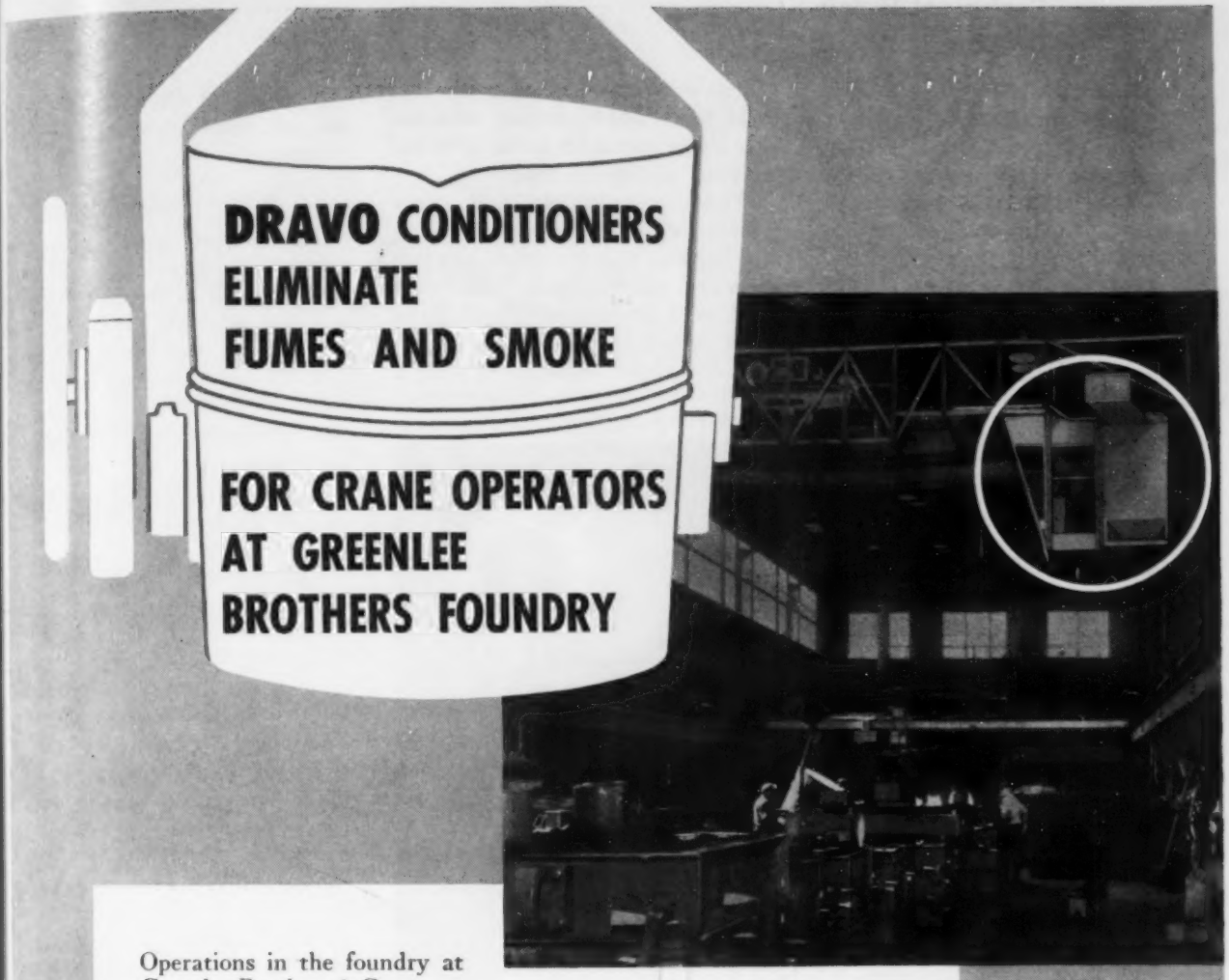
In the modern cold-rolling, tandem strip mills, greater production is effected by increasing the strip speed and decreasing acceleration and deceleration time.

To reduce rejections due to gage




STEELMILL DRIVE response to a suddenly applied change in voltage setting. This is typical of results obtained from Anacom studies.

*Turn to Page 150*




Operations in the foundry at Greenlee Brothers & Company had been hampered by excessive smoke and fumes. Smoke, which resulted from burning of residual oil and flour, and fumes from core ovens made it impossible for crane operators to work at maximum efficiency. Installation of Dravo Crane Cab Conditioners eliminated these intolerable conditions, greatly improving the efficiency and alertness of crane operators while safe-guarding their health.

Dravo Crane Cab Conditioners are ruggedly-constructed ventilating units, fabricated specifically for rough industrial usage and are especially designed for conditions which require fume removal. These units provide a continuous supply of air from which dust and dirt has been removed. Electric strip heaters maintain temperatures of 68° to 72° F. in crane cabs during winter months.

These units can be easily installed vertically, horizontally, or at any angle which space permits. A separate control cabinet allows on-off operations and regulates heat. Dravo Crane Cab Conditioners are also ideal for installation on mobile cranes, pulpits and other equipment operating where similar conditions exist.

Only Dravo has a complete line of crane cab coolers and conditioners. All units are available now! Write or phone your nearest Dravo office today for more information and have our representative call on you. Ask for Bulletin No. PS-1301-13

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**CORPORATION**
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variation, the stand speed must be maintained accurately, even during acceleration and deceleration. To achieve these goals an improved regulator system is required; precise analysis of the system is the key to improvement.

In any regulating system, many variables are involved, each of which affect the system operation. For example, in a paper-mill drive, the couch may provide a friction load for a 500-hp motor, whereas the drier motor may be 100 hp, driving an inertia load.

These two stands and many others, with their widely varying mechanical and electrical characteristics, must be made to operate with very precise relationships to each other. To determine, in advance, the performance of such a system under all conditions would be an impossible task without computers.

### Where Analysis Starts

Analysis of regulating systems consists of three major steps:

1. General layout of the regulator and analysis of the performance of all the component parts.
2. Translation of the component-part performance into overall system performance under specified conditions.
3. Interpretation of overall system performance in terms of the end product.

Prior to the development of the Anacom, analog computer, and other suitable computers, by far the most difficult phase was the second requirement — translation of component-part performance into overall system performance.

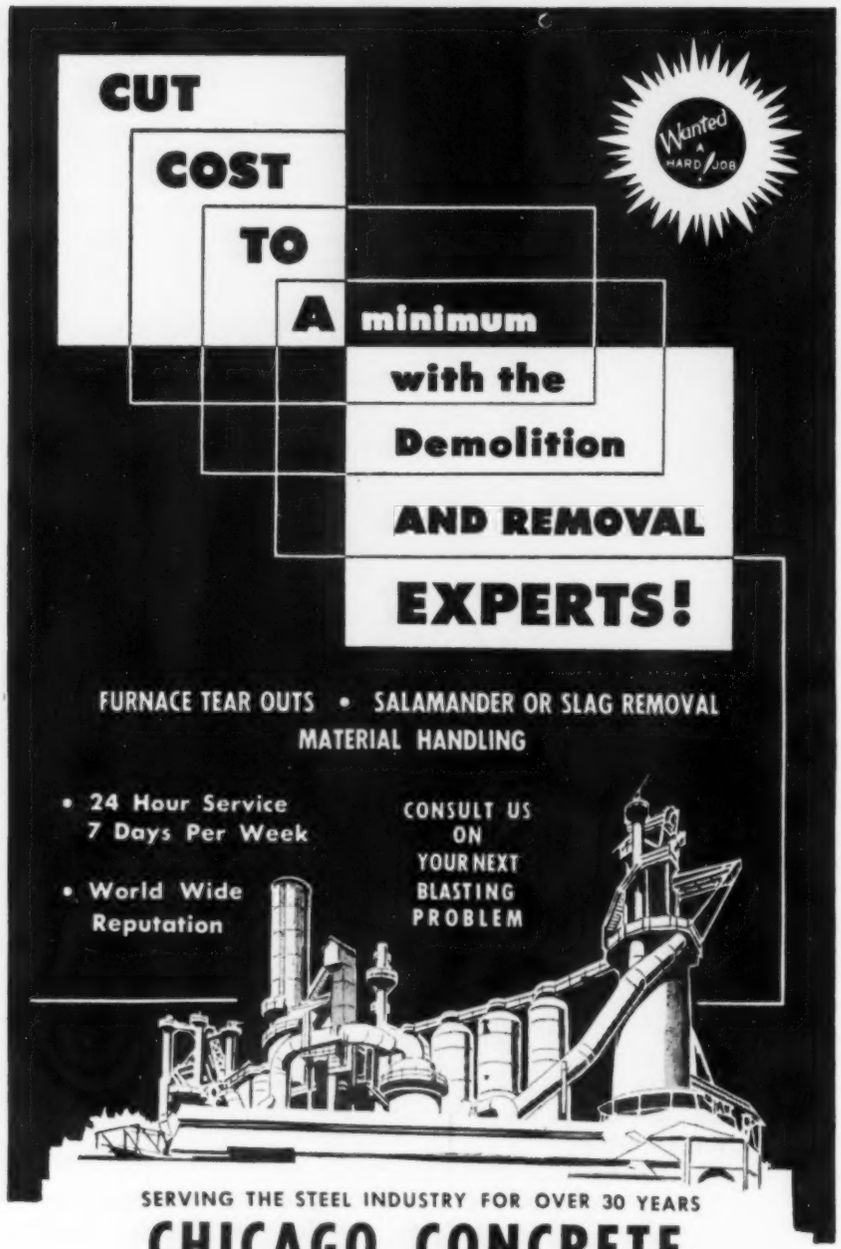
To solve the problem, simplifying assumptions were necessarily made (such as linearization of component characteristics) and some factors were assumed to be negligible simply because they could not be coped with by usual methods of calculation. As a result, the designer could determine fairly well the steady-state performance, but could predict only sketchily the dynamic performance of his regulating system.

### Devise Electrical Analogs

With the Anacom, all components and factors, electrical or mechanical, are reduced to simplified electrical analogs.

First the analog for the motor is devised. Several relationships can be immediately set up. Motor speed can be related to induced emf; motor torque can be equated to a function of armature current. Similarly, motor torque can be written in terms of load and acceleration; and terminal voltage in terms of induced emf and armature current.

Combining these several equations, a relationship between terminal voltage, motor speed, and load torque can be established in terms of the mechanical time delay and the armature time constant.



# Peace, Economy Rumors Fail to Chill Steel Market

**Consumer demand remains torrid despite talk of peace and cuts in government spending . . . May not reach supply-demand balance by third quarter . . . Maintenance downtime threatens.**

The steel market continues to set a torrid pace—despite rumors that the peace offensive and economies in Washington would cause consumer demand to fall flat on its back.

As a matter of fact there are indications that the third quarter, instead of being the period when supply and demand reach balance, will find some consumers as hard pressed to fill their steel needs as they are today.

**Troubles Ahead . . .** In the months ahead manufacturers trying to get more steel will run into these limiting factors:

(1) The expanding shell program will carve a bigger chunk out of available supplies of large sized bars and hot-top quality steel.

(2) Wildcat strikes will compound production and scheduling problems, shaving output of sorely needed products.

(3) Though the industry has been fortunate in keeping downtime to a minimum by careful scheduling of maintenance, constant hammering of continuous high production is taking its toll on equipment. A number of steel producers must face the dilemma of whether to pause for preventive maintenance or risk breakdowns of tortured machines.

**Shells Take Bars . . .** The new increase in the artillery shell program, scheduled to hit in third quarter, will be a blow to civilian users of hot-rolled and cold-finished bars in large diameters—1.5-in. and over.

Government requirements for shell steel will probably be increased 30 pct over second quarter needs, or about half a million tons. Hot-topping facilities, already a production bottleneck, will feel an additional burden.

Small diameter bars are generally in good supply, and the shell program is not likely to affect production in these sizes to any extent that would tighten the market.

**Bad News . . .** Shutdown of the million-ton No. 3 openhearth shop at Homestead Works of U. S. Steel Corp. was bad news to users of plates, shapes and wide flange beams. Production of this shop went largely into mills producing these shapes.

While the Corporation is obligated to fill second quarter orders (taken before the sudden shutdown for safety reasons), the third quarter is likely to be difficult. Some second quarter tonnage won't be delivered until third quarter.

**Spread The Loss . . .** U. S. Steel hasn't yet told all customers the outlook for third quarter, but the news will be anything but good. Some shifting around of available ingot production from other melting units is being worked out, and an effort is being made to distribute the burden, but plates, shapes, and wide flange beams will bear the brunt.

Net ingot loss will be somewhat less than capacity of the closed shop, since hot metal that normally went into these furnaces will be available for other melting units, permitting increased output in furnaces still running.

**Others Can't Help . . .** There is little chance that any of the plate, shape, and wide flange beam production loss will be made up by other producers, although they will be under plenty of pressure to do so. These products already are in tight supply and producers for the most part are working at capacity.

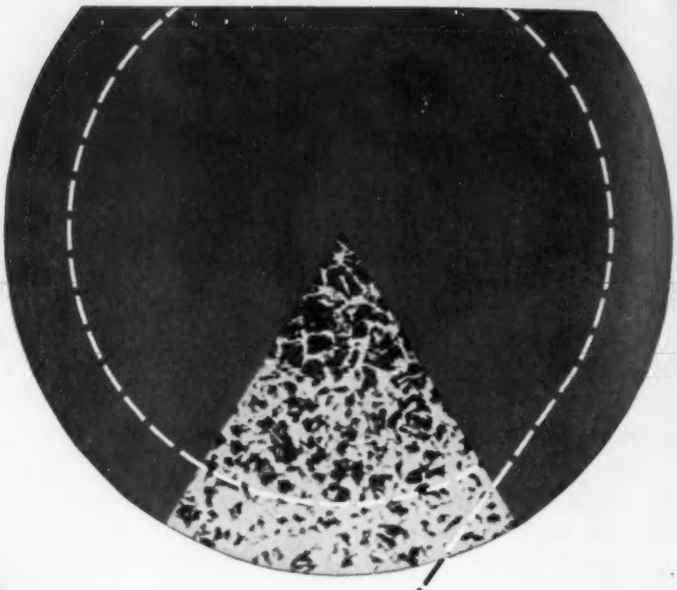
In fact, the development comes at a time when plants that have been rolling light plates on strip-sheet mills are tapering off this production except for what they are required to produce for military orders.

**Hurts Alloy Output . . .** The closing also has had an effect on alloy production at a time when the company had barely recovered from last summer's steel strike. Alloy will absorb 5 pct of the overall loss in the Pittsburgh district.

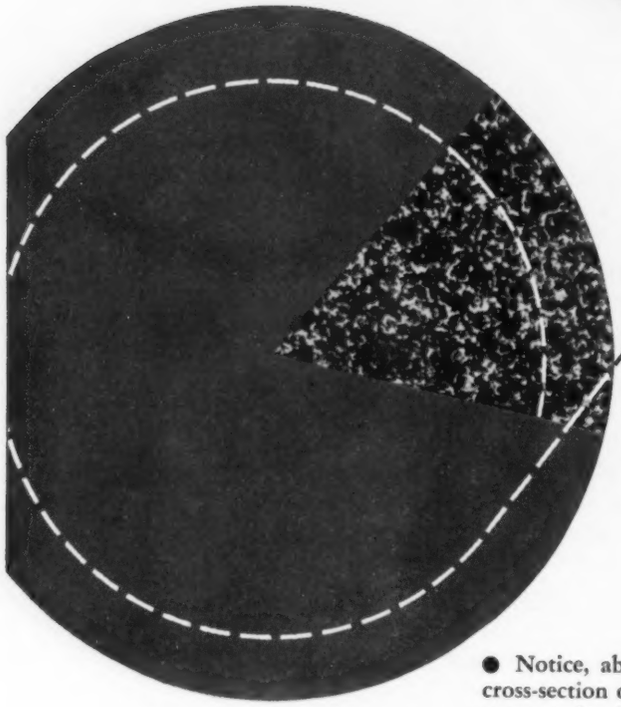
Since the furnaces affected were in the 50-60 ton class, the shutdown means loss of flexibility in output of specialty steels normally produced in these smaller units. Consumers of forging ingots and big blooms will be hit.

**Conversion Continues . . .** Demand for conversion ingots has eased in the Midwest. But this does not mean that conversion is tapering off. Some steelmaking expansion programs have temporarily outpaced finishing facilities, and rolling space continues at a premium.

Pressure on finishing facilities has caused one mill to postpone replacement of a tired slabbing mill, at least until third quarter.



*The "decarb" (light-colored) area in the ordinary heat-treated bar at right must usually be removed before parts can be made from the stock.*



*Notice that this Republic carbon corrected alloy steel bar has had full carbon content restored to outer edges by carbon correction.*

# HERE IS WHERE Republic Carbon-Corrected Alloy Steel Bars help you make a profit

● Notice, above at the right, the "decarb" area in the outer edge of the cross-section of a cold drawn alloy steel bar as ordinarily heat treated. Then compare it with the cross-section below at the left. Notice how the carbon has been restored by carbon correction even to the extreme outer circumference.

Here, in the outer rim of Republic Carbon-Corrected Alloy Steel Bars, is the profit-area for your machine tools . . . the part of the bar you don't have to machine away into chips and shavings.

Let our Republic 3-Dimension Metallurgical Service work with your metallurgists and production men to adapt Republic Carbon-Corrected Cold Drawn Alloy Steel Bars to your products. Your Republic Steel salesman can arrange for the Republic Field Metallurgist to call at your convenience.

LAB FIELD MILL

**3-DIMENSION Metallurgical Service**

. . . combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

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*Republic* COLD DRAWN
REPUBLIC STEEL
**ALLOY STEEL BARS**

# Market Briefs and Bulletins

**Push Heavy Press Program . . .** Desire of the Air Force to speed up the heavy press program was indicated last week when it ordered Aluminum Co. of America to start building a $40,000 forging press plant in Cuyahoga Heights, Ohio. Officials of the Cleveland suburb had blocked issuance of a building permit for 3 months, causing Brig. General Kern D. Metzger to comment: "The Department of the Air Force has determined to tolerate no further obstruction to the national defense program . . . "

**Will Double Capacity . . .** In operation for less than 2 months, Hanna Steel Corp., Birmingham, already has two new buildings under construction which will more than double the plant's capacity. Operations in the new buildings are expected to start within 60 days. The company, currently operating on a two-shift basis, will soon switch to 24-hr production.

**May Stop Improvement . . .** U. S. Army engineers believe that appropriations hearings this week may result in curtailment of a proposed $2 billion Great Lakes harbors and rivers improvement program. At a recent Great Lakes shipping forum, Brig. General C. H. Chorpening told ore shippers that plans to improve the harbors would depend on the outcome of congressional hearings.

**Increase Sales . . .** Retail sales of General Electric's major appliances during the first quarter were about 10 pct ahead of the sales rate for the same period last year. Refrigerators, lead item in the GE line, were up about 3 pct. On a month-by-month comparison, total retail sales for March 1953 were about 20 pct better than in March of last year. One company spokesman predicts retail sales for the entire year may also end up about 20 pct ahead of 1952.

**Not Under Allocation Plan . . .** National Production Authority has ruled that American industry can use any purchases of 511 tons of nickel recently made available by Japan without charging it back against normal allocations. However, the nickel is still subject to all end use controls and can be employed only for permitted purposes.

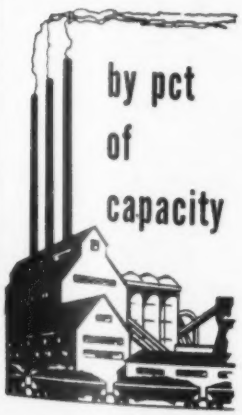
**Close Down Two Furnaces . . .** Improved supply of ingots from the Geneva, Utah, plant of U. S. Steel has resulted in the shutdown of two 25-ton openhearths adjoining U. S. Steel's Pittsburg, Calif., plant. The furnaces, owned by General Services Administration, are in war-built foundry constructed and operated by U. S. Steel for the government for production of special steel castings. Entire foundry will be held on a standby basis.

**Add to Sheet Demand . . .** There are indications that the southern Ohio and Kentucky area is developing into a strong sheet market. Expansion of appliance companies there is responsible for this trend.

**Strike . . .** A strike of railroad workers hit steel production in the Youngstown district again this week. The walkout on the Youngstown & Northern R.R. Co. halted all melting operations in district plants of U. S. Steel Corp. Early this week there was some hope that threat of a court-imposed injunction would get the men back to work. The strike, which started Apr. 8, was costing 8000 ingot tons per day and idling 10,000 workers.

**Revise Figure . . .** Granite City Steel Co. has revised its net income percent of investment figure for 1952 from that originally listed in THE IRON AGE *Financial Analysis of the Steel Industry* last week. Figure should be 7.4 pct instead of 13.5 pct.

## STEEL OPERATIONS

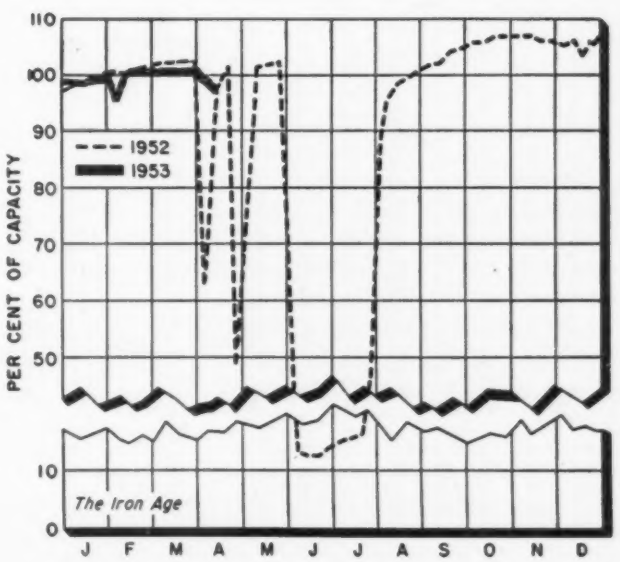



**District Operating Rates**

| District | Week of Apr. 12 | Week of Apr. 5 |
|---|---|---|
| Pittsburgh | 99.0 | 98.0* |
| Chicago | 105.0 | 106.0* |
| Philadelphia | 94.0 | 94.0 |
| Valley | 65.0 | 94.0* |
| West | 105.0 | 104.0* |
| Cleveland | 99.0 | 97.0* |
| Buffalo | 94.0 | 94.0 |
| Detroit | 103.0 | 108.0* |
| Birmingham (South) | 101.0 | 101.0 |
| Wheeling | 102.0 | 102.0 |
| South Ohio River | 88.0 | 86.0 |
| St. Louis | 71.0 | 71.0 |
| East | 103.0 | 96.0* |
| AGGREGATE | 97.0 | 99.0 |

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



# U. S. Suspends Copper Stockpiling

**Action taken to ease price picture . . . NPA ends allocation of refined copper to brass, wire mills . . . African copper at 32¢, may force Chilean price cut.—By *R. L. Hatschek.***

Doings in the copper business continue to hold the spotlight in nonferrous markets this week. Late last week the government stopped buying copper. Idea was to knock the government prop out from under the red metal's price.

Existing contracts for stockpile purchases are not affected by the move. But no new commitments are being made "for the present," Office of Defense Mobilization states. The agency issued this official statement in explanation of its temporary withdrawal from the market: "The action has been taken to prevent added strain on a market which is not in too plentiful supply."

**End Allocations . . .** On the other hand, allocations of refined copper to brass, bronze and copper wire mills have been discarded. National Production Authority said it took this step on recommendation of copper advisory committees in view of the more favorable copper outlook.

Government will continue to allocate to users the primary products of the brass, bronze and copper wire mills. And mills must still obtain authorization for purchases of copper other than the types they normally use.

**Quotas About the Same . . .** Net allocations of refined copper in the first quarter totaled approximately the same as in the fourth quarter of 1952. Brass mills got about 47.2 pct, copper wire mills got about 47.9 pct and foundries and miscellaneous consumers got 4.9 pct.

Actual tonnages allocated for the period were: Brass mills, 179,449 tons; copper wire mills, 182,022 tons; and all other users, 18,746 tons. Total added up to 380,217 short tons.

**Prices Settling . . .** Meanwhile, on the price front, things were rapidly nearing the clarification that had been expected a month ago. Major mine producers had all set their prices at 30¢ per lb at the beginning of the month. Now the other sellers are drifting down, nearer to that quotation.

One custom smelter that had been selling both domestic and foreign metal at 33¢ cut 1¢ from its price and others rapidly followed. This narrowed the range to 30¢ to 32¢ per lb for domestic copper prices.

**Chile Holding Out . . .** Rhodesian copper is being offered at 32¢ by the Belgian producer and feeling is that this price will be shaved still further to meet competition. In view of this situation, many people in the copper trade believe the Chileans will be forced into cutting back on their price before too long.

So far they have insisted on 36.5¢ per lb. But they are realistic people and it seems certain that as soon as sales begin to drop off significantly they'll have to meet competition from other copper sources.

**Scrap Softer . . .** Custom smelters and ingot makers had withdrawn scrap buying prices in the face of a lack of interest for June and July delivery copper. Quotations of custom smelters and ingot makers were revised downward this week. The new price levels reflect a cut of 2¢, with No. 1 copper wire now 25¢ to 25½¢ per lb.

**Lead, Zinc Tariffs . . .** Proposed sliding scale tariff for zinc ores and concentrates was erroneously labeled zinc tariff last week. Tariff asked in the bills mentioned is the same for zinc as for lead and with zinc selling at 11.00¢ per lb, the tariff would be 5.50¢.

**Aluminum Output Higher . . .** The aluminum industry outdid all previous efforts for the month of February and produced 92,649 net tons of the light metal in that month. Snapping back from the bad breaks, production topped the previous month by 2754 tons despite the fewer number of days in the month.

Sheet and plate shipments in February were 53,839 tons, slightly less than January. Foil shipments also dipped, totaling 8,821,215 lb for February against 9,535,711 lb shipped in the previous month.

**Tin Off More . . .** Prompt tin prices in New York slid off even further during the past week, with the Monday price down to 99.5¢. Scrap dealers cut buying prices on block tin 10¢ to 90¢ per lb.

**NONFERROUS METAL PRICES**

*(Cents per lb, except as noted)*

| | Apr. 8 | Apr. 9 | Apr. 10 | Apr. 11 | Apr. 13 | Apr. 14 |
|---|---|---|---|---|---|---|
| Copper, electro, Conn. | 30.00-33.00 | 30.00-33.00 | 30.00-33.00 | 30.00-32.00 | 30.00-32.00 | 30.00-32.00 |
| Copper, Lake, delivered | 33.25 | 33.25 | 33.25 | 33.00 | 33.00 | 33.00 |
| Tin, Straits, New York | $1.10½ | $1.09 | $1.05 | .... | 99.50 | 99.50* |
| Zinc, East St. Louis | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 |
| Lead, St. Louis | 12.80 | 12.80 | 12.80 | 12.80 | 12.80 | 12.80 |

Note: Quotations are going prices.
* Tentative

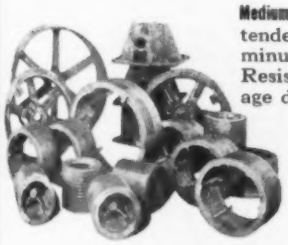
**Light Castings** . . . These piston rings are produced in Ni-Resist for engines used in corrosive service.

# Investigate NI-RESIST . . .

## No other cast metal provides such a unique combination of useful engineering properties

NI-RESIST® is available nationwide in 5 basic types to meet a variety of industrial demands: resistance to corrosion, heat and wear; strength and toughness; good machinability; high electrical resistance and non-magnetic characteristics . . . as well as heat conductivity and controlled thermal expansion.

At the present time, nickel is available for the production of Ni-Resist and other alloys containing nickel, for end uses in defense and defense supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.



**Medium Castings** . . . Free from tendencies to corrode, comminutor parts cast in Ni-Resist lengthen life of sewage disposal equipment.

**Heavy Castings** . . . Casing, outer column and discharge head of this 14-ton pump are cast in Ni-Resist for resistance to salt water and other corrosive media.

# SOURCES OF SUPPLY FOR NI-RESIST CASTINGS

### EASTERN SECTION...

Abrasive Alloy Castings Co.
Bridgeboro, N. J.

American Abrasive Metals Co.
Irvington, N. J.

American Brake Shoe Co.
230 Park Avenue
New York 17, N. Y.

American Brake Shoe Co.
Engineered Castings Division
10 Mt. Read Blvd.
Rochester 11, N. Y.

American Chain & Cable Co., Inc.
Acco Casting Division
Reading, Pa.

The Baldwin-Lima-Hamilton Corp.
Eddystone Division
Paschall P. O.
Philadelphia 42, Pa.

Barnett Foundry & Machine Co.
536 Lyons Avenue
Irvington, N. J.

Curtiss-Wright Corp.
Metals Processing Division
162 Grider Street
Buffalo 11, N. Y.

Hunt-Spiller Manufacturing Corp.
383 Dorchester Avenue
South Boston 27, Massachusetts

Janney Cylinder Co.
7425 State Road
Philadelphia 36, Pa.

Koppers Company, Inc.
Metal Products Division
Bush & Hamburg Streets
Baltimore 3, Maryland

Kutztown Foundry & Machine Corp.
Kutztown, Pa.

Montague Machine Company
Turners Falls, Massachusetts

Olney Foundry, Link-Belt Co.
180 W. Duncannon Avenue
Philadelphia 20, Pa.

The Richmond Foundry & Mfg. Co., Inc.
Hermitage Road
Richmond 20, Virginia

The Taylor & Fenn Co.
Saville Street
Windsor, Connecticut

Weatherly Foundry & Mfg. Co.
Weatherly, Pa.

### MIDDLE SECTION...

American Brake Shoe Co.
Electro-Alloys Division
1936 Taylor Street
Elyria, Ohio

American Cast Iron Pipe Co.
P. O. Box 2603
Birmingham 2, Alabama

Baker Perkins, Inc.
1000 Hess Street
Saginaw, Michigan

Carondelet Foundry Co.
2101 S. Kingshighway
St. Louis 10, Mo.

Chicago Hardware Foundry Co.
2500 Commonwealth Avenue
North Chicago, Illinois

DeZurik Shower Co.
Foundry Division
Sartell, Minnesota

Duluth Brass Works Co.
5002 Ramsey Street
Duluth, Minnesota

The Duriron Co., Inc.
Dayton 1, Ohio

Engineering Castings, Inc.
405 South Linden
Marshall, Michigan

The Fahralloy Company
150th St. & Lexington Ave.
Harvey, Illinois

Frank Foundries Corp.
2020 Third Avenue
Moline, Illinois

The Hamilton Foundry & Machine Co.
1551 Lincoln Avenue
Hamilton, Ohio

Kingsport Foundry & Mfg. Corp.
East Sullivan and Main Streets
Kingsport, Tennessee

Michiana Products Corp.
P. O. Box 302
Michigan City, Indiana

Michigan Steel Casting Co.
1999 Guoin Street
Detroit 7, Michigan

Moran Flexible Joint Co., Inc.
215 West Main Street
Louisville 2, Kentucky

Reda Pump Co.
Bartlesville, Oklahoma

Ross-Meehan Foundries
1601 Carter Street
Chattanooga 1, Tennessee

St. Paul Foundry & Mfg. Co.
500 Como Avenue
St. Paul 3, Minnesota

Service Foundry Division
Avondale Marine Ways, Inc.
416 Erato Street
New Orleans 13, Louisiana

Shenango-Penn Mold Co.
Dover, Ohio

Standard Brass & Mfg. Co.
P. O. Box 1469
Port Arthur, Texas

The Sterling Foundry Co.
Wellington, Ohio

Texaloy Foundry Co.
1407 Hoefgen Avenue
San Antonio 3, Texas

The W. S. Tyler Co.
3615 Superior Avenue
Cleveland 14, Ohio

Wells Manufacturing Co.
7800 North Austin Avenue
Skokie, Illinois

### WESTERN SECTION...

Centrifugal Casting Co.
3245 Cherry Avenue
Long Beach 7, California

Dameron Metal Sales Co.
927 South Sante Fe Avenue
Compton, California

Electric Steel Foundry Co.
2141 North West 25th Avenue
Portland 10, Oregon

Pacific Foundry Co., Ltd.
3100 19th Street
San Francisco 10, California

Stanley Foundries
6009 Sante Fe Avenue
Huntington Park, California

Utility Steel Foundry
3320 East Slauson Avenue
Vernon (L. A.) California

# THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N. Y.

# Nonferrous Prices

*(Effective Apr. 14, 1953)*

## MILL PRODUCTS

*(Cents per lb, unless otherwise noted)*

### Aluminum

*(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)*

**Flat Sheet:** 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢. 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

**Plate, ¼-in. and Heavier:** 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

**Extruded Solid Shapes:** Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to $1.27; 36 to 38, 47.0¢ to $1.86.

**Rod, Rolled:** 1.064-in. to 4.5-in., 2S-F 3S-F, 41.0¢ to 36.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

**Screw Machine Stock:** Rounds, 11S-T3, ⅛ to 11/32-in., 58.4¢ to 45.9¢; ⅜ to 1½-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base 5000 lb.

**Drawn Wire:** Coiled, 0.051 to 0.374-in., 2S, 43.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

**Extruded Tubing:** Rounds, 63S-T5, OD 1¼ to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

**Roofing Sheet:** Flat, per sheet, 0.019-in., 28 x 72 in., $1.247; x 96 in., $1.662; x 120 in., $2.077; x 144 in., $2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

### Magnesium

*(F.o.b. mill, freight allowed)*

**Sheet and Plate:** FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ⅛ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

**Extruded Round Rod:** M, diam ¼ to 0.311 in., 77¢; ⅓ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ⅜ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

**Extruded Solid Shapes, Rectangles:** M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

**Extruded Round Tubing:** M, 0.049 to 0.057 in. wall thickness; OD, ¼ to 5/16 in., $1.43; 5/16 to ⅝ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

*(100,000 lb base, f.o.b. mill)*

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

### Nickel, Monel, Inconel

*(Base prices, f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 86½ | 67½ | 92½ |
| Strip, CR | 92½ | 70½ | 98½ |
| Rod, bar | 82½ | 65½ | 88½ |
| Angles, HR | 82½ | 65½ | 88½ |
| Plate, HR | 84½ | 66½ | 90½ |
| Seamless Tube | 115½ | 100½ | 137½ |
| Shot, blocks | | 57 | |

### Copper, Brass, Bronze

*(Freight included on 500 lb)*

| | Sheet | Rods | Extruded Shapes |
|---|---|---|---|
| Copper | 48.51 | | 50.58 |
| Copper, h-r | 50.48 | 46.83 | |
| Copper, drawn | | 48.08 | |
| Low brass | 45.99 | 45.68 | |
| Yellow brass | 42.87 | 42.56 | |
| Red brass | 47.11 | 46.80 | |
| Naval brass | 47.01 | 41.07 | 42.33 |
| Leaded brass | | | 39.95 |
| Com. bronze | 48.76 | 48.45 | |
| Mang. bronze | 50.73 | 44.62 | 46.18 |
| Phos. bronze | 70.50 | 70.75 | |
| Muntz metal | 44.91 | 40.47 | 41.72 |
| Ni silver, 10 pct | 56.56 | 59.83 | 62.89 |

## PRIMARY METALS

*(Cents per lb, unless otherwise noted)*

| | |
|---|---|
| Aluminum ingot, 99+%, 10,000 lb, freight allowed | 20.50 |
| Aluminum pig | 19.50 |
| Antimony, American, Laredo, Tex. | 34.50 |
| Beryllium copper, per lb conta'd Be | $37.72 |
| Beryllium aluminum 5% Be, Dollars Per lb contained Be | $72.75 |
| Bismuth, ton lots | $2.25 |
| Cadmium, del'd | $2.00 |
| Cobalt, 97-99% (per lb) | $2.40 to $2.47 |
| Copper, electro, Conn. Valley | 30.00 to 32.00 |
| Copper, Lake, delivered | 33.00 |
| Gold, U. S. Treas., dollars per oz. | $35.00 |
| Indium, 99.8%, dollars per troy oz. | $2.25 |
| Iridium, dollars per troy oz. | $175 to $185 |
| Lead, St. Louis | 12.80 |
| Lead, New York | 13.00 |
| Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb. | 27.00 |
| Magnesium, sticks, 100 to 500 lb. | 45.00 to 47.00 |
| Mercury, dollars per 76-lb. flask, f.o.b. New York | $195 to $198 |
| Nickel electro, f.o.b. N. Y. warehouse | 63.08 |
| Nickel oxide sinter, at Copper Creek, Ont., contained nickel | 56.25 |
| Palladium, dollars per troy oz. | $24.00 |
| Platinum, dollars per troy oz. | $90 to $93 |
| Silver, New York, cents per oz. | 85.25 |
| Tin, New York | 99.50 |
| Titanium, sponge | $5.00 |
| Zinc, East St. Louis | 11.00 |
| Zinc, New York | 11.83 |
| Zirconium copper, 50 pct | $6.20 |

## REMELTED METALS

### Brass Ingot

*(Cents per lb, delivered carloads)*

| | |
|---|---|
| 85-5-5-5 ingot | |
| No. 115 | 27.50 |
| No. 120 | 26.75 |
| No. 123 | 26.00 |
| 80-10-10 ingot | |
| No. 305 | 32.00 |
| No. 315 | 29.75 |
| 88-10-2 ingot | |
| No. 210 | 40.75 |
| No. 215 | 37.75 |
| No. 245 | 32.75 |
| Yellow ingot | |
| No. 405 | 22.75 |
| Manganese bronze | |
| No. 421 | 27.50 |

### Aluminum Ingot

*(Cents per lb del'd., 30,000 lb and over)*

| | |
|---|---|
| 95-5 aluminum-silicon alloys | |
| 0.30 copper, max. | 25.00-26.00 |
| 0.60 copper, max. | 24.75-25.50 |
| Piston alloys (No. 122 type) | 24.00-24.75 |
| No. 12 alum. (No. 2 grade) | 22.50-23.50 |
| 108 alloy | 23.25-24.50 |
| 195 alloy | 23.25-24.50 |
| 13 alloy (0.60 copper max.) | 24.75-26.00 |
| ASX-679 | 23.00-24.00 |

### Steel deoxidizing aluminum, notch-bar granulated or shot

| | |
|---|---|
| Grade 1—95-97½% | 24.00-26.00 |
| Grade 2—92-95% | 23.25-24.50 |
| Grade 3—90-92% | 22.50-23.50 |
| Grade 4—85-90% | 21.50-23.00 |

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, freight allowed, 5000 lb lots)*

| | |
|---|---|
| Copper | |
| Cast, oval, 15 in. or longer | 45.14 |
| Electrodeposited | 37.98 |
| Flat rolled | 45.64 |
| Brass, 80-20 | |
| Cast, oval, 15 in. or longer | 43.515 |
| Zinc, flat cast | 20.25 |
| Ball, anodes | 18.50 |
| Nickel, 99 pct plus | |
| Cast | 79.50 |
| Roller, depolarized | 80.50 |
| Cadmium | $2.15 |
| Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. | 94⅛ |

### Chemicals

*(Cents per lb, f.o.b. shipping points)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 63 |
| Copper sulfate, 99.5 crystals, bbl. | 12.85 |
| Nickel salts, single or double, 4-100 lb bags, frt. allowed | 30.00 |
| Nickel chloride, 375 lb drum | 38.00 |
| Silver cyanide, 100 oz lots, per oz. | 75½ |
| Sodium cyanide, 96 pct domestic 200 lb drums | 19.25 |
| Zinc cyanide, 100 lb drum | 47.7 |

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 28⅝ | 27⅞ |
| Yellow brass | 21⅝ | 19⅝ |
| Red brass | 25⅛ | 24⅝ |
| Comm. bronze | 26⅛ | 25⅝ |
| Mang. bronze | 20 | 19¼ |
| Brass rod ends | 19¾ | |

### Custom Smelters' Scrap

*(Cents per pound carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 25 —25½ |
| No. 2 copper wire | 23½—23⅝ |
| Light copper | 22 —22⅛ |
| *Refinery brass | 20 —21 |

* Dry copper content.

### Ingot Makers' Scrap

*(Cents per pound, carload lots, delivered to refinery)*

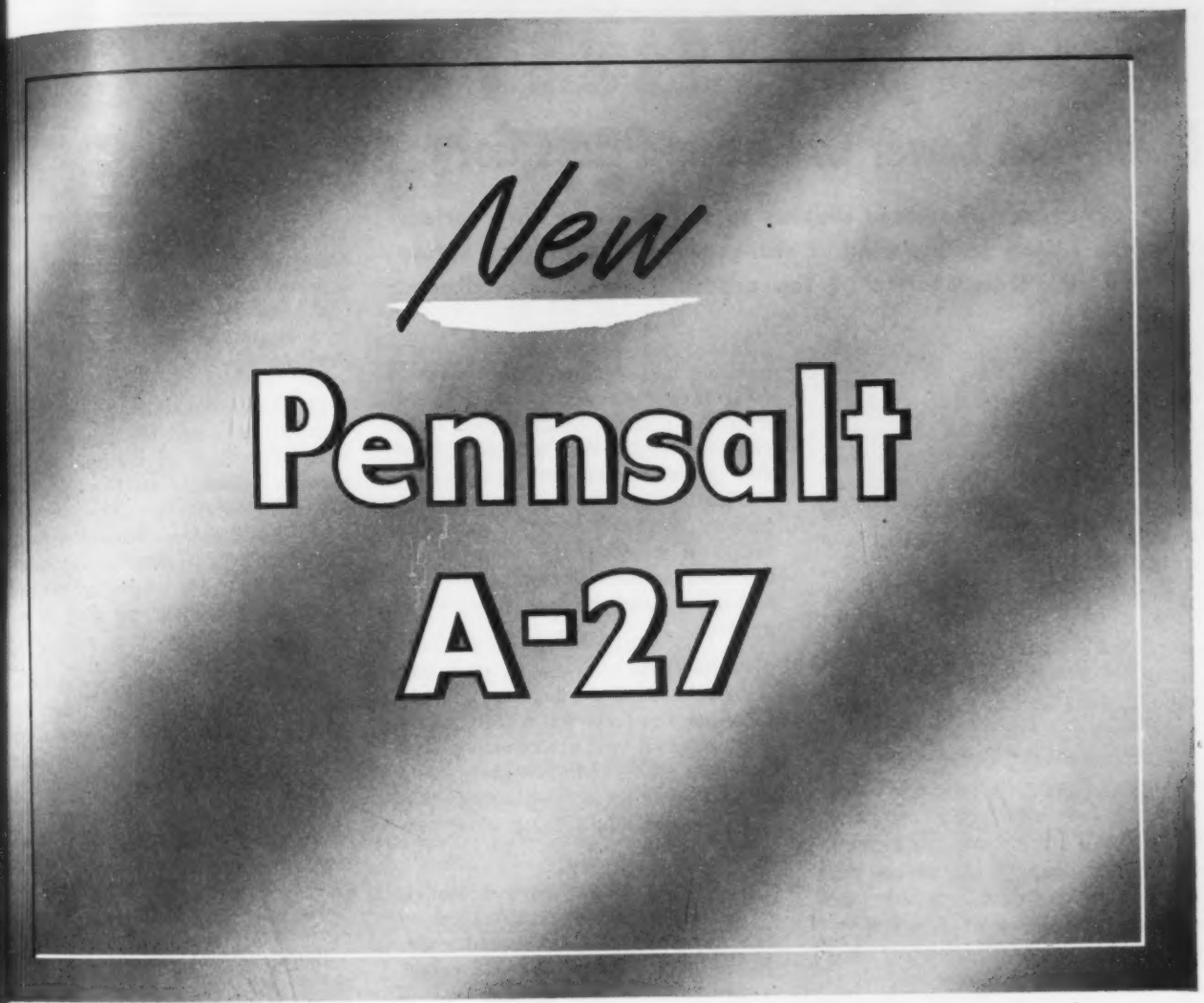
| | |
|---|---|
| No. 1 copper wire | 25 —25½ |
| No. 2 copper wire | 23½—23⅝ |
| Light copper | 22 —22⅛ |
| No. 1 composition | 21 |
| No. 1 comp. turnings | 20 |
| Rolled brass | 16 —16¼ |
| Brass pipe | 16 —16¼ |
| Radiators | 15½—16 |
| *Aluminum* | |
| Mixed old cast | 13½—14½ |
| Mixed new clips | 15 —15½ |
| Mixed turnings, dry | 13½—15 |
| Pots and pans | 13½—14½ |

### Dealers' Scrap

*(Dealers' buying price, f.o.b. New York in cents per pound)*

| | |
|---|---|
| **Copper and Brass** | |
| No. 1 heavy copper and wire | 24 |
| No. 2 heavy copper and wire | 21 —21½ |
| Light copper | 19 —19½ |
| New type shell cuttings | 19 —19½ |
| Auto radiators (unsweated) | 15 |
| No. 1 composition | 19 |
| No. 1 composition turnings | 18⅛ |
| Unlined red car boxes | 17 —18 |
| Cocks and faucets | 16 —16½ |
| Mixed heavy yellow brass | 13 —13⅛ |
| Old rolled brass | 14½—15 |
| Brass pipe | 17 —17½ |
| New soft brass clippings | 18 —18⅛ |
| Brass rod ends | 17 —17⅛ |
| No. 1 brass rod turnings | 16½—17 |
| **Aluminum** | |
| Alum. pistons and struts | 6½— 7 |
| Aluminum crankcases | 9 —10 |
| 2S aluminum clippings | 12 —13 |
| Old sheet and utensils | 9 —10 |
| Borings and turnings | 7½— 8 |
| Misc. cast aluminum | 9 —10 |
| Dural clips (24S) | 10 —11 |
| **Zinc** | |
| New zinc clippings | 6⅛ |
| Old zinc | 5 |
| Zinc roofings | 3 |
| Old die cast scrap | 4 |
| **Nickel and Monel** | |
| Pure nickel clippings | 58 —60 |
| Clean nickel turnings | 58 —60 |
| Nickel anodes | 58 —60 |
| Nickel rod ends | 58 —60 |
| New Monel clippings | 33 |
| Clean Monel turnings | 35 |
| Old sheet Monel | 30 —32 |
| Nickel silver clippings, mixed | 15 —16 |
| Nickel silver turnings, mixed | 14 —14⅛ |
| **Lead** | |
| Soft scrap, lead | 9¾—10⅛ |
| Battery plates (dry) | 5 — 5⅛ |
| Batteries, acid free | 3⅛ |
| **Magnesium** | |
| Segregated solids | 15 —16 |
| Castings | 14 —15 |
| **Miscellaneous** | |
| Block tin | 90 |
| No. 1 pewter | 65 |
| No. 1 auto babbitt | 50 —55 |
| Mixed common babbitt | 13½—14 |
| Solder joints | 16⅛ |
| Siphon tops | 55 |
| Small foundry type | 17 —17½ |
| Monotype | 12½—13 |
| Lino. and stereotype | 11½—12 |
| Electrotype | 9¾—10 |
| Hand picked type shells | 7¾— 8 |
| Lino. and stereo. dross | 4 |
| Electro dross | 3½ |

MORE FACTS ON GETTING **A BETTER START FOR YOUR FINISH**




## A SUPERIOR ALL-PURPOSE NON-ETCHING CLEANER **for ALUMINUM**

HERE is a true advancement in aluminum cleaning! A new, versatile, dependable product that does a far better job—usually in less time and at lower cost!

Pennsalt Cleaner A-27 is a granular material—dry, free-flowing, and dust-free. Its special formulation provides maximum detergency and free rinsing—yet it will not attack or stain the aluminum.

A-27 has an outstanding ability to *thoroughly* remove tough soils, including red and black marking inks, finger marks, cutting oils, and other shop grime. It rinses quickly and completely, *even if it is allowed to dry on the work, and it will not streak or stain.*

Pennsalt Cleaner A-27 is highly recommended for cleaning aluminum sheet stock prior to anodizing, chromatizing, phosphatizing, or other surface treatment. *And note this:* even though A-27 gives vastly superior results, it costs the same or less than other makes of aluminum cleaners!

This great new product is part of a complete aluminum "package" Pennsalt now offers to fabricators. To help you use these materials with maximum efficiency, Pennsalt's Metal Processing Service fieldmen will be happy to apply their experience to your operation.

For information about Cleaner A-27, or any of the products in the Pennsalt aluminum "package", write to: Metal Processing Service, Pennsylvania Salt Manufacturing Company, *East:* 278 Widener Building, Philadelphia 7, Pa. *West:* Woolsey Building, 2168 Shattuck Ave., Berkeley 4, Calif.

**Pennsalt Chemicals**

### The Pennsalt Aluminum "Package"

**Pennsalt Cleaner AE-16.** A new, non-scaling, non-sludging etchant. Produces exceptionally uniform etch. Rinses free. Can be cleaned from tank with stream of water.

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# How Much Lower Can Scrap Prices Go?

**Scrap market seemed shaping up for a test of lower prices . . . Wait for lowering of still-heavy stockpiles . . . Spring scrap "thaw" here . . . Top grades infected by weakness.**

With mill buying spiritless in many districts and old orders being dragged out, scrap seemed to be shaping up for a testing of the new lower price structure. Scrap men wondered whether prices could go much lower without drying up sources of supply or whether the status quo would at least hold.

Depressing the market today was buyer apathy, caused partly by still overly tall stockpiles while the scrap "thaw" was in process. Scrap men hope the slow tempo may change when reserves are lowered by high production rates. Today's trend is down but it may be somewhat misleading—for sometimes comparatively small orders can peg a price.

As one scrap man warned this week, "If you want a steady and substantial volume of scrap a respectable price must be paid. Any prolonged period of too-low prices can starve out sources of supply."

The soft tone of secondary grades and turnings now has definitely infected once enormously popular premium quality steel. To illustrate this, the prices of No. 1 heavy melting in some districts slipped a notch this week.

**Pittsburgh**—The market is growing progressively weaker. With the two largest consumers out of the market and holding up shipments, the softness communicated itself to the top melting grades on an appraisal basis. No. 1 heavy melting and No. 1 bundles were off $1. Secondary openhearth grades were down $2 as No. 2 steel and No. 2 bundles slipped to $40 and $38 respectively, delivered. One consumer reportedly bought No. 2 bundles at $36, forecasting a further break. Blast furnace grades were off $2 to $3, low phos was down $1. Cast and railroad specialties also were weaker.

**Chicago** — Dealers were watching eastern markets and predicting a further skid locally. Clipping prices were receding and everybody was moving what they could out of their yards with the possible exception of some good electric furnace and good bundles. Mills are well stocked here. Two blast furnaces have been laid up. Rejections are being reported generally including steelmaking grades. Poor movement in blast furnace seems to be spreading into secondary steelmaking grades.

**Philadelphia** — Prices on steelmaking grades were holding steady early this week but there was a feeling that No. 2 bundles were pretty shaky. Low phos was off $1 and some cast grades eased a bit in price. Feeling was that new business might bring other cast items down.

**New York**—With demand loafing for even once-popular premium grades and secondary grades continuing depressed, scrap men marked time for new orders. No. 1 steel, some brokers thought, would be showing up in greater quantities in about 2 weeks. Blast furnace grades were hard to move and the price trend was down. Price dips of last week held on No. 2 steel and bundles. Low phos dipped.

**Detroit** — Secondary grades have headed for bottom, widening the differential between primary grades. But No. 1 bundles still hang on at old ceiling by means of the formula. Most forecasters believe that sinking secondary grades will inevitably drag No. 1 grades down with them, but mills are still willing to pay the premium for top bundles. Turnings continue to drop. Industrial scrap is flowing at a record pace from auto plants.

**Cleveland** — Talk of rejections and need for quality in secondary grades is the main topic here as another $2 dip in No. 2 steel is anticipated. Mills which have been living off heavy inventories are expected to come back into the market before the end of the month.

**Birmingham**—Steel scrap continues to move north in fair quantities but mills apparently are limiting purchases because of heavy stockpiles. The largest scrap buyer in the South was still out of the market but was expected to return next week. No. 2 heavy melting and No. 2 bundles are both down $1.50. Cast prices took a $1 drop this week.

**St. Louis**—With sizable inventories of scrap iron and the prospect of a seasonable flow of material to this market, district steel mills have placed no new orders. One steel mill is still limiting the shipment of orders already placed because of congestion. Railroad lists are increasing now that roads are receiving new steel for repairs.

**Cincinnati**—Shipments in the area are moving along at a good rate but dealers and brokers are wary about predicting what will happen when present orders have been filled. Random length rails lost ground this week, dropping $2 to $50. Market generally was slow as weakness in No. 2 bundles, turnings and cast prices held steady.

**Buffalo**—Prices on No. 2 bundles and No. 2 heavy melting steel skidded $1.50 to $2.00 a ton on orders placed here by one of the top mill consumers. Weakness and uncertainty dominate market buying. Interest is light, while a fair amount of scrap is reported in dealers' yards. Softer tendencies in other markets is also a factor here.

**Boston**—Scrap story in New England this week is one of skidding prices on most fronts. No. 1 steelmaking grades held their ground but No. 2 heavy melting and No. 2 bundles slipped off. Turnings are also $1 lower.

**West Coast**—Reported granting of an export license to a Los Angeles area dealer was biggest scrap news last week. In San Francisco and Los Angeles, the largest purchaser announced resumption of No. 3 bundles at $20. Little tonnage was bought because dealers went to those still paying the higher No. 2 price for bundles with coated stock. Others in the area will probably soon take up the old class and it is expected to spread to Seattle.

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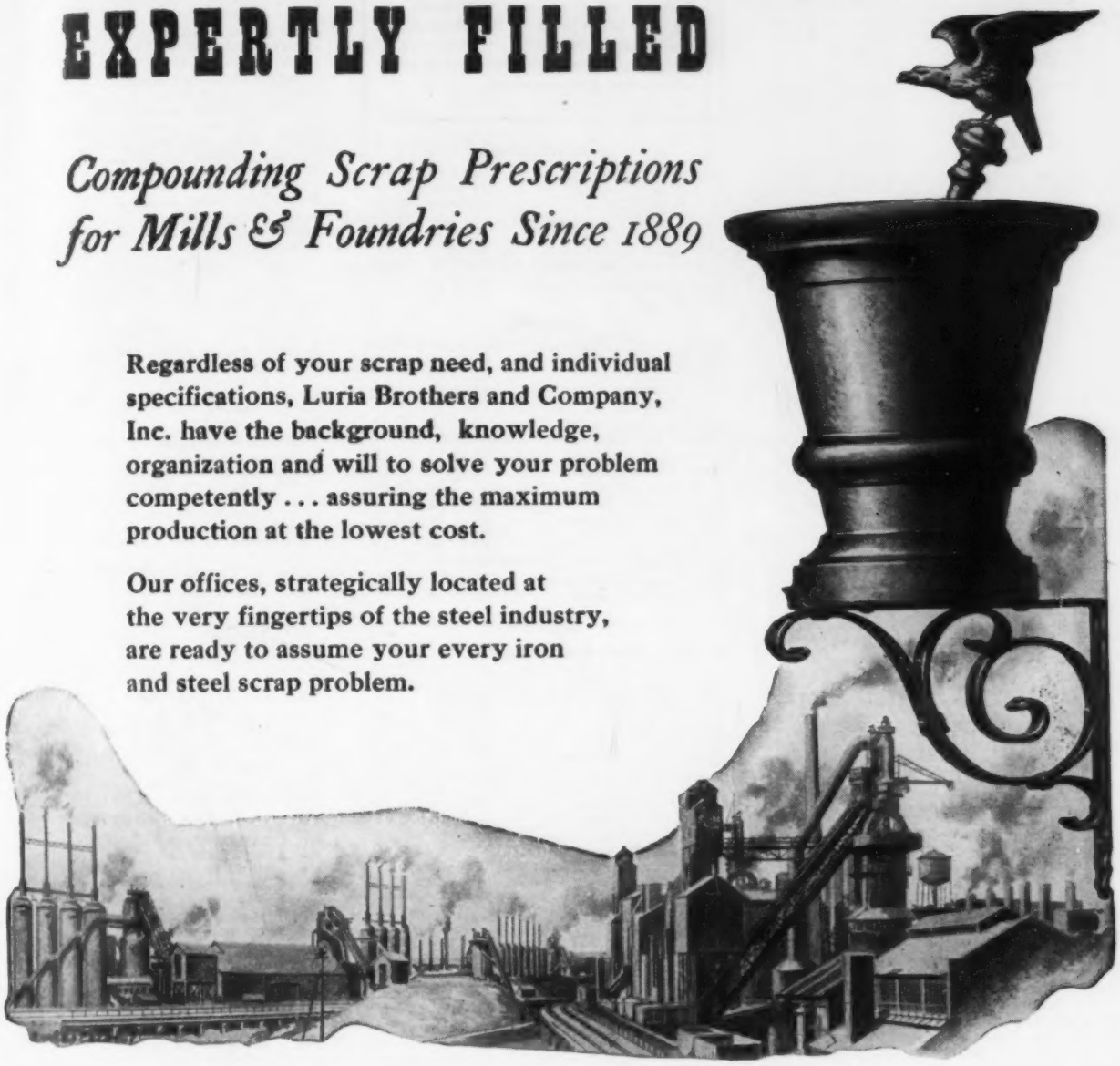

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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

# Scrap Prices

*(Effective Apr. 14, 1953)*

## Iron and Steel Scrap

**Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.**

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $43.50 to $44.00 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 bundles | 43.50 to 44.00 |
| No. 2 bundles | 37.00 to 38.00 |
| Machine shop turn. | 28.50 to 29.00 |
| Mixed bor. and ms. turns. | 28.50 to 29.00 |
| Shoveling turnings | 33.00 to 34.00 |
| Cast iron borings | 33.00 to 34.00 |
| Low phos. punch'gs, plate | 49.00 to 50.00 |
| Heavy turnings | 42.00 to 43.00 |
| No. 1 RR. hvy. melting | 46.00 to 47.00 |
| Scrap rails, random lgth. | 48.00 to 49.00 |
| Rails 2 ft and under | 54.00 to 55.00 |
| RR. steel wheels | 54.50 to 55.50 |
| RR. spring steel | 54.50 to 55.50 |
| RR. couplers and knuckles | 54.50 to 55.50 |
| No. 1 machinery cast. | 50.00 to 51.00 |
| Cupola cast. | 45.00 to 46.00 |
| Heavy breakable cast. | 41.00 to 42.00 |
| Malleable | 48.00 to 49.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $40.00 to $42.00 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 factory bundles | 44.00 to 45.00 |
| No. 1 dealers' bundles | 42.00 to 43.00 |
| No. 2 dealers' bundles | 38.00 to 40.00 |
| Machine shop turn. | 23.00 to 24.00 |
| Mixed bor. and turn. | 23.00 to 24.00 |
| Shoveling turnings | 24.00 to 25.00 |
| Cast iron borings | 23.00 to 24.00 |
| Low phos. forge crops | 51.00 to 52.00 |
| Low phos. punch'gs, plate | 46.00 to 48.00 |
| Low phos. 3 ft and under | 44.00 to 46.00 |
| No. 1 RR. hvy. melting | 46.00 to 47.00 |
| Scrap rails, random lgth. | 52.00 to 53.00 |
| Rerolling rails | 55.00 to 56.00 |
| Rails 2 ft and under | 56.00 to 58.00 |
| Locomotive tires, cut | 50.00 to 51.00 |
| Cut bolsters & side frames | 48.00 to 50.00 |
| Angles and splice bars | 52.00 to 53.00 |
| RR. steel car axles | 59.00 to 62.00 |
| RR. couplers and knuckles | 50.00 to 51.00 |
| No. 1 machinery cast. | 45.00 to 46.00 |
| Cupola cast. | 42.00 to 43.00 |
| Heavy breakable cast. | 36.00 to 37.00 |
| Cast iron brake shoes | 40.00 to 41.00 |
| Cast iron car wheels | 44.00 to 46.00 |
| Malleable | 42.00 to 43.00 |
| Stove plate | 38.00 to 39.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $43.00 to $44.00 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 bundles | 43.00 to 44.00 |
| No. 2 bundles | 37.00 to 38.00 |
| Machine shop turn. | 29.50 to 31.00 |
| Mixed bor. and turn. | 34.50 to 36.00 |
| Shoveling turnings | 34.50 to 36.00 |
| **Clean cast chem. borings** | **41.50 to 42.00** |
| Low phos. 5 ft and under | 44.50 to 45.50 |
| Low phos. 2 ft and under | 46.50 to 47.50 |
| Elec. furnace bundles | 44.50 to 45.50 |
| Heavy turnings | 40.50 to 41.50 |
| RR. steel wheels | 51.00 to 52.00 |
| RR. spring steel | 51.00 to 52.00 |
| Rails 18 in. and under | 58.00 to 59.00 |
| Cupola cast. | 42.00 to 43.00 |
| Heavy breakable cast. | 44.50 to 45.00 |
| **Cast iron carwheels** | **47.00 to 49.00** |
| Malleable | 46.00 to 47.00 |
| Unstripped motor blocks. | 32.00 to 33.00 |
| No. 1 machinery cast. | 47.00 to 48.00 |
| Charging box cast. | 42.00 to 43.00 |

### Cleveland

| | |
|---|---|
| **No. 1 hvy. melting** | **$43.50 to $44.50** |
| No. 2 hvy. melting | 40.50 to 41.50 |
| **No. 1 bundles** | **43.50 to 44.50** |
| **No. 2 bundles** | **38.50 to 39.50** |
| **No. 1 busheling** | **43.50 to 44.50** |
| Machine shop turn. | 29.00 to 30.00 |
| Mixed bor. and turn. | 29.00 to 30.00 |
| Shoveling turnings | 33.00 to 34.00 |
| Cast iron borings | 33.00 to 34.00 |
| **Low phos. 2 ft and under** | **49.00 to 50.00** |
| **Drop forge flashings** | **42.00 to 43.00** |
| **No. 1 RR. hvy. melting** | **45.00 to 46.00** |
| Rails 3 ft and under | 60.00 to 61.00 |
| Rails 18 in. and under | 62.00 to 63.00 |
| **Railroad grate bars** | **40.00 to 41.00** |
| **Steel axle turnings** | **42.00 to 43.00** |
| **Railroad cast** | **49.00 to 50.00** |
| **No. 1 machinery cast.** | **51.00 to 52.00** |
| **Stove plate** | **45.00 to 46.00** |
| **Malleable** | **50.00 to 51.00** |

### Youngstown

| | |
|---|---|
| **No. 1 hvy. melting** | **$44.00 to $45.00** |
| No. 2 hvy. melting | 41.00 to 42.00 |
| **No. 1 bundles** | **44.00 to 45.00** |
| **No. 2 bundles** | **39.00 to 40.00** |
| Machine shop turn. | 29.00 to 30.00 |
| Shoveling turnings | 33.00 to 34.00 |
| Cast iron borings | 33.00 to 34.00 |
| **Low phos. plate** | **49.00 to 50.00** |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $45.50 to $46.00 |
| No. 2 hvy. melting | 41.50 to 42.00 |
| **No. 1 bushelings** | **42.75 to 43.50** |
| **No. 1 bundles** | **42.75 to 43.75** |
| No. 2 bundles | 39.50 to 40.00 |
| Machine shop turn. | 32.00 to 32.50 |
| **Mixed bor. and turn.** | **36.00 to 36.50** |
| **Shoveling turnings** | **36.50 to 37.00** |
| **Cast iron borings** | **36.50 to 37.00** |
| **Low phos. plate** | **48.75 to 49.75** |
| **Scrap rails, random lgth.** | **47.75 to 48.75** |
| **Rails 2 ft and under** | **51.75 to 52.75** |
| **RR. steel wheels** | **50.75 to 51.75** |
| **RR. spring steel** | **50.75 to 51.75** |
| **RR. couplers and knuckles** | **50.75 to 51.75** |
| **No. 1 machinery cast.** | **45.00 to 46.00** |
| **No. 1 cupola cast.** | **42.50 to 43.00** |

### Detroit

**Brokers' Buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $37.00 to $38.00 |
| No. 2 hvy. melting | 34.50 to 35.00 |
| No. 1 bundles, openhearth | 40.00 to 41.00 |
| No. 2 bundles | 30.50 to 31.50 |
| Heavy turnings | 34.00 to 35.00 |
| **New busheling** | **39.00 to 40.00** |
| **Drop forge flashings** | **39.00 to 40.00** |
| Machine shop turn. | 22.00 to 23.00 |
| Mixed bor. and turn. | 24.50 to 25.50 |
| Shoveling turnings | 24.50 to 25.50 |
| Cast iron borings | 24.50 to 25.50 |
| Electric furnace bundles. | 42.00 to 43.00 |
| Low phos. punch'gs, plate, heavy | 44.50 to 45.50 |
| Low phos. punch'gs, plate, light | 42.00 to 43.00 |
| **No. 1 cupola cast.** | **47.00** |
| Heavy breakable cast. | 41.00 |
| Stove plate | 42.00 |
| **Automotive cast.** | **50.00** |

### St. Louis

| | |
|---|---|
| **No. 1 hvy. melting** | **$41.50 to $42.50** |
| No. 2 hvy. melting | 38.50 to 39.00 |
| No. 2 bundled sheets | 36.50 to 37.00 |
| Machine shop turn. | 27.00 to 28.00 |
| Shoveling turnings | 30.00 to 31.00 |
| Rails, random lengths | 51.00 to 52.00 |
| Rails 18 in. and under | 58.00 to 60.00 |
| Locomotive tires, uncut | 47.00 to 48.00 |
| Angles and splice bars | 49.00 to 50.00 |
| **Std. steel car axles** | **55.00 to 56.00** |
| RR. spring steel | 48.00 to 49.00 |
| Cupola cast. | 45.00 to 46.00 |
| Hvy. breakable cast. | 35.00 to 36.00 |
| Cast iron brake shoes | 41.00 to 42.00 |
| Stove plate | 38.00 to 40.00 |
| Cast iron car wheels | 47.00 to 48.00 |
| Malleable | 40.00 to 41.00 |
| Unstripped motor blocks. | 35.00 to 36.00 |

### New York

**Brokers' Buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $37.00 |
| No. 2 hvy. melting | $33.00 to 34.00 |
| No. 2 bundles | 31.00 to 32.00 |
| Low phos. 2 ft and less. | 39.00 to 40.00 |
| Machine shop turn. | 21.50 to 22.50 |
| Mixed bor. and turn. | 21.50 to 22.50 |
| Shoveling turnings | 24.50 to 25.50 |
| **Clean cast chem. borings** | **32.00 to 33.00** |
| No. 1 machinery cast. | 45.00 to 46.00 |
| Mixed yard cast. | 37.00 |
| Charging box cast. | 39.00 to 39.50 |
| Heavy breakable cast. | 39.00 to 39.50 |
| Unstripped motor blocks | 28.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $37.00 to $38.00 |
| No. 2 hvy. melting | 34.50 to 35.50 |
| No. 1 bundles | 37.00 to 38.00 |
| No. 2 bundles | 32.50 to 33.50 |
| **No. 1 busheling** | **37.00 to 38.00** |
| Machine shop turn. | 26.00 to 27.00 |
| **Shoveling turnings** | **30.00 to 31.00** |
| **Cast iron borings** | **30.00 to 31.00** |
| Electric furnace bundles. | 39.00 to 40.00 |
| Bar crops and plate | 44.00 to 45.00 |
| Structural and plate, 2 ft. | 44.00 to 45.00 |
| No. 1 RR. hvy. melting | 38.00 to 39.00 |
| Scrap rails, random lgth. | 42.00 to 43.00 |
| Rerolling rails | 46.00 to 47.00 |
| Rails, 18 in. and under | 46.00 to 47.00 |
| Angles & splice bars | 46.00 to 47.00 |
| Std. steel axles | 51.50 to 53.50 |
| No. 1 cupola cast. | 41.00 to 42.00 |
| Stove plate | 37.00 to 38.00 |
| Cast iron car wheels | 46.00 to 47.00 |
| Charging box cast. | 35.00 to 36.00 |
| Heavy breakable | 32.00 to 33.00 |
| Unstripped motor blocks. | 34.00 to 35.00 |
| **Mashed tin cans** | **24.00 to 25.00** |

### Boston

**Brokers' Buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $34.17 |
| No. 2 hvy. melting | $31.25 to 32.25 |
| No. 1 bundles | 34.17 |
| No. 2 bundles | 28.25 to 30.00 |
| **No. 1 busheling** | **34.17** |
| Machine shop turn. | 20.00 |
| Mixed bor. and short turn. | 24.00 |
| Shoveling turnings | 24.00 |
| Clean cast chem. borings | 31.17 |
| Mixed cupola cast. | 32.00 to 33.00 |
| **Heavy breakable cast.** | **32.00 to 33.00** |
| Stove plate | 30.00 to 31.00 |
| **Unstripped motor blocks.** | **28.25** |

### Cincinnati

| | |
|---|---|
| No. 1 hvy. melting | $44.50 to 45.50 |
| No. 2 hvy. melting | 41.00 to 42.50 |
| No. 1 bundles | 44.50 to 45.50 |
| No. 2 bundles | 39.00 to 40.00 |
| Machine shop turn. | 29.00 to 30.00 |
| Mixed bor. and turn. | 29.00 to 30.00 |
| Shoveling turnings | 30.00 to 31.00 |
| Cast iron borings | 30.00 to 31.00 |
| **Low phos. 18 in. & under** | **49.00 to 50.00** |
| Rails, random lengths | 49.00 to 50.00 |
| Rails, 18 in. and under | 58.00 to 59.00 |
| No. 1 cupola cast. | 44.00 to 45.00 |
| Hvy. breakable cast. | 37.00 to 38.00 |
| Drop broken cast. | 49.00 to 50.00 |

### San Francisco

| | |
|---|---|
| **No. 1 hvy. melting** | **$30.00** |
| **No. 2 hvy. melting** | **26.00** |
| **No. 1 bundles** | **29.00** |
| **No. 2 bundles** | **24.00** |
| No. 3 bundles | 20.00 |
| **Machine shop turn.** | **12.00** |
| **Cast iron borings** | **16.00** |
| **No. 1 RR. hvy. melting** | **37.00** |
| No. 1 cupola cast. | $37.00 to 39.00 |

### Los Angeles

| | |
|---|---|
| **No. 1 hvy. melting** | **$30.00** |
| No. 2 hvy. melting | 24.00 |
| **No. 1 bundles** | **29.00** |
| **No. 2 bundles** | **24.00** |
| No. 3 bundles | 20.00 |
| **Mach. shop turn.** | **12.00** |
| **Shoveling turnings** | **16.00** |
| **Cast iron borings** | **16.00** |
| **Elec. fur. 1 ft and under** | **33.00** |
| **No. 1 RR. hvy. melting** | **37.00** |
| No. 1 cupola cast. | 39.00 |

### Seattle

| | |
|---|---|
| No. 1 hvy. melting | $30.00 |
| No. 2 hvy. melting | 26.00 |
| No. 1 bundles | 29.00 |
| No. 2 bundles | 24.00 |
| No. 1 cupola cast. | 37.00 |
| Mixed yard cast. | 36.00 |

### Hamilton, Ont.

| | |
|---|---|
| No. 1 hvy. melting | $35.50 |
| No. 1 bundles | 35.50 |
| No. 2 bundles | 35.00 |
| Mechanical bundles | 33.50 |
| Mixed steel scrap | 31.50 |
| Bushelings | 30.50 |
| Bush., new fact. prep'd. | 33.50 |
| Bush., new fact. unprep'd. | 32.50 |
| Short steel turnings | 32.50 |
| Mixed bor. and turn. | 32.50 |
| Rails, remelting | 35.50 |
| Rails, rerolling | 44.50 |
| Cast scrap | 50.00 |

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# Comparison of Prices

*(Effective Apr. 14, 1953)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Apr. 14 1953 | Apr. 7 1953 | Mar. 17 1953 | Apr. 15 1952 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 3.775¢ | 3.775¢ | 3.775¢ | 3.60¢ |
| Cold-rolled sheets | 4.575 | 4.575 | 4.575 | 4.35 |
| Galvanized sheets (10 ga) | 5.075 | 5.075 | 5.075 | 4.80 |
| Hot-rolled strip | 3.725 | 3.725 | 3.725 | 3.50 |
| Cold-rolled strip | 5.20 | 5.20 | 5.20 | 4.75 |
| Plate | 3.90 | 3.90 | 3.90 | 3.70 |
| Plates wrought iron | 9.00 | 9.00 | 9.00 | 7.85 |
| Strains C-R strip (No. 302) | 36.75† | 36.75† | 36.75† | 36.75 |
| **Tin and Ternplate:** (per base box) | | | | |
| Tinplate (1.50 lb.) cokes | $8.95 | $8.95 | $8.95 | $8.70 |
| Tinplate, electro (0.50 lb.) | 7.65 | 7.65 | 7.65 | 7.40 |
| Special coated mfg. ternes | 7.75 | 7.75 | 7.75 | 7.50 |
| **Bars and shapes:** (per pound) | | | | |
| Merchant bars | 3.95¢ | 3.95¢ | 3.95¢ | 3.70¢ |
| Cold finished bars | 4.925 | 4.925 | 4.925 | 4.55 |
| Alloy bars | 4.675 | 4.675 | 4.675 | 4.30 |
| Structural shapes | 3.85 | 3.85 | 3.85 | 3.65 |
| Stainless bars (No. 302) | 31.50† | 31.50† | 31.50† | 31.50 |
| Wrought iron bars | 10.05 | 10.05 | 10.05 | 9.50 |
| **Wire:** (per pound) | | | | |
| Bright wire | 5.225¢ | 5.225¢ | 5.225¢ | 4.85¢ |
| **Rails:** (per 100 lb.) | | | | |
| Heavy rails | $3.775 | $3.775 | $3.775 | $3.60 |
| Light rails | 4.25 | 4.25 | 4.25 | 4.00 |
| **Semifinished Steel:** (per net ton) | | | | |
| Rerolling billets | $59.00 | $59.00 | $59.00 | $56.00 |
| Slabs, rerolling | 59.00 | 59.00 | 59.00 | 56.00 |
| Forging billets | 70.50 | 70.50 | 70.50 | 66.00 |
| Alloy blooms, billets, slabs | 76.00 | 76.00 | 76.00 | 70.00 |
| **Wire Rod and Skelp:** (per pound) | | | | |
| Wire rods | 4.325¢ | 4.325¢ | 4.325¢ | 4.10¢ |
| Skelp | 3.55 | 3.55 | 3.55 | 3.35 |

† Add 4.7 pct to base and extras.

| | | | | |
|---|---|---|---|---|
| **Composite:** (per pound) | | | | |
| Finished steel base price | 4.376¢ | 4.376¢ | 4.376¢ | 4.131¢ |

| | Apr. 14 1953 | Apr. 7 1953 | Mar. 17 1953 | Apr. 15 1952 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry, del'd Phila. | $60.69 | $60.69 | $60.69 | $57.97 |
| Foundry, Valley | 55.00 | 55.00 | 55.00 | 52.50 |
| Foundry, Southern, Cin'ti | 58.93 | 58.93 | 58.93 | 55.93 |
| Foundry, Birmingham | 51.38 | 51.38 | 51.38 | 48.88 |
| Foundry, Chicago† | 55.00 | 55.00 | 55.00 | 52.50 |
| Basic del'd Philadelphia | 59.77 | 59.77 | 59.77 | 57.09 |
| Basic, Valley furnace | 54.50 | 54.50 | 54.50 | 52.00 |
| Malleable, Chicago† | 55.00 | 55.00 | 55.00 | 52.50 |
| Malleable, Valley | 55.00 | 55.00 | 55.00 | 52.50 |
| Ferromanganese‡ | 226.25 | 226.25 | 226.25 | 186.25 |

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy pages.

| | | | | |
|---|---|---|---|---|
| **Composite:** (per gross ton) | | | | |
| Pig iron | $55.26 | $55.26 | $55.26 | $52.72 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | *$43.75* | $44.75 | $44.75 | $43.00* |
| No. 1 steel, Phila. area | 43.50 | 43.50 | 44.00 | 41.50* |
| No. 1 steel, Chicago | *41.00* | 43.50 | 43.50 | 41.50* |
| No. 1 bundles, Detroit | 40.50 | 40.50 | 40.50 | 41.18* |
| Low. phos., Youngstown | 49.50 | 49.50 | 49.50 | 46.50* |
| No. 1 mach'y cast, Pittsburgh | *50.50* | 51.50 | 52.50 | 52.75 |
| No. 1 mach'y cast, Philadel'a. | *47.50* | 48.00 | 49.00 | 52.00* |
| No. 1 mach'y cast, Chicago | *45.50* | 47.00 | 47.50 | 45.75 |

* Basing pt., less broker's fee. † Shipping pt., less broker's fee. Delivered prices, including broker's fee, unless otherwise noted.

| | | | | |
|---|---|---|---|---|
| **Composite:** (per gross ton) | | | | |
| No. 1 heavy melting scrap | *$42.75* | $43.92 | $44.08 | $42.00 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.75 | $14.75 | $14.75 | $14.75 |
| Foundry coke, prompt | 17.25 | 17.25 | 17.75 | 17.75 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | *31.00‡* | 31.50‡ | 30.75‡ | 24.50 |
| Copper, Lake, Conn. | *33.00* | 33.25 | 32.125 | 24.625 |
| Tin, Straits, New York | *99.50†* | $1.11* | $1.21½ | $1.21½ |
| Zinc, East St. Louis | 11.00 | 11.00 | 11.00 | 10.50 |
| Lead, St. Louis | 12.80 | 12.80* | 13.30 | 18.80 |
| Aluminum, virgin ingot | 20.50 | 20.50 | 20.50 | 19.00 |
| Nickel, electrolytic | 63.08 | 63.08 | 63.08 | 59.68 |
| Magnesium, ingot | 27.00 | 27.00 | 27.00 | 24.50 |
| Antimony, Laredo, Tex. | 34.50 | 34.50 | 34.50 | 30.00 |

† Tentative. ‡ Average. * Revised.

## Composite Price Notes

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Scrap Steel Composite**

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (2)6000 lb or over, (3)450 to 1499 lb, (4) 2000 to 3999 lb.

## WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

| Cities | City Delivery Charge | Sheets | | | Strip | | Plates | Shapes | Bars | | Alloy Bars | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-Rolled | Cold-Rolled (15 gage) | Galvanized (10 gage) | Hot-Rolled | Cold-Rolled | | Standard Structural | Hot-Rolled | Cold-Finished | Hot-Rolled A 4615 As rolled | Hot-Rolled A 4140 Annealed | Cold-Drawn A 4615 As rolled | Cold-Drawn A 4140 Annealed |
| Baltimore | $.20 | 5.81 | 7.17 | 8.04–8.32 | 6.42 | ..... | 6.05 | 6.47 | 6.41 | 7.18–7.43 | ..... | ..... | ..... | ..... |
| Birmingham | .15 | 5.80 | 6.65 | 7.70[1] | 5.80 | ..... | 6.10 | 5.95 | 5.80 | 7.85 | ..... | ..... | ..... | ..... |
| Boston | .20 | 6.45–6.52 | 7.35–7.71 | 8.34–8.39 | 6.55 | 8.50[2] | 6.75–6.80 | 6.56–6.75 | 6.42 | 7.46–7.54 | 10.85 | 11.15–11.17 | 12.85 | 13.15–13.18 |
| Buffalo | .20 | 5.77–5.80 | 6.60–6.65 | 8.31 | 6.00–6.21 | ..... | 6.30–6.40 | 6.08–6.15 | 5.78–5.80 | 6.95 | 10.70 | 11.00–11.07 | 12.70 | 13.00–13.07 |
| Chicago | .20 | 5.80–5.81 | 6.65 | 7.90 | 5.83–5.84 | ..... | 5.95–6.00 | 5.95 | 5.83 | 6.56–6.80 | ..... | 10.65 | ..... | 12.65 |
| Cincinnati | .15 | 6.13 | 6.72 | 8.21 | 6.14 | ..... | 6.47 | 6.42 | 6.13 | 7.16 | ..... | 11.07 | ..... | 13.07 |
| Cleveland | .20 | 5.80–5.81 | 6.65 | 8.04 | 6.00–6.01 | ..... | 6.12–6.17 | 6.28 | 5.89 | 6.66–6.90 | ..... | 10.79 | ..... | 12.79 |
| Denver | | 7.17–7.39 | 8.23 | 9.60 | 7.43–7.69 | 8.90 | 7.37–7.54 | 7.50–7.80 | 7.61–7.71 | 8.24–8.48 | ..... | ..... | ..... | ..... |
| Detroit | .20 | 5.99–6.00 | 6.81–6.90 | 8.59 | 6.13–6.34 | 7.29–7.85 | 6.45–6.47 | 6.42–6.69 | 6.12–6.47 | 7.10–7.23 | 10.72 | ..... | 12.72 | 12.42–12.92 |
| Houston | .20 | 6.35–6.74 | 7.00–7.78 | 8.67–8.70 | 6.70–6.95 | ..... | 6.60–6.85 | 6.60–6.82 | 6.75–7.00 | 9.00–9.35 | 11.90 | 11.35–11.90 | 13.60 | 13.90 |
| Kansas City | .20 | 6.47 | 7.31 | 8.62 | 6.51 | ..... | 6.62–6.67 | 6.62 | 6.50 | 7.57 | ..... | 11.32 | ..... | ..... |
| Los Angeles | .20 | 6.60 | 8.45 | 9.50 | 6.70 | 9.15 | 6.70 | 6.60 | 6.60 | 8.35–8.65 | ..... | 12.05 | ..... | 14.00 |
| Memphis | .10 | 6.56 | 7.40 | ..... | 6.98 | ..... | 6.71 | 6.71 | 6.59 | 7.77 | ..... | ..... | ..... | ..... |
| Milwaukee | .20 | 5.97–6.16 | 6.82 | 8.07 | 6.00–6.20 | ..... | 6.12–6.36 | 6.12–6.31 | 6.00–6.19 | 6.83–8.07 | ..... | 10.82 | ..... | 12.82 |
| New Orleans | .15 | 6.28 | 7.12 | ..... | 6.32 | 8.32 | 6.43 | 6.43 | 6.31 | 7.85 | ..... | ..... | ..... | ..... |
| New York | .30 | 6.11–6.62 | 7.27–7.41 | 8.07–8.58 | 6.56–6.72 | 8.94 | 6.60–6.88 | 6.34–6.70 | 6.59–6.79 | 7.46–7.53 | 10.68–10.74 | 10.91–11.04 | 12.67–12.74 | 12.97–13.04 |
| Norfolk | .20 | 6.75 | ..... | ..... | 7.30 | ..... | 6.65 | 6.65 | 6.55 | 8.30 | ..... | ..... | ..... | ..... |
| Philadelphia | .25 | 6.11 | 7.13 | 7.95–8.30 | 6.45–6.46 | ..... | 6.24–6.28 | 6.17 | 6.42 | 7.45 | ..... | 10.67–10.79 | ..... | 12.79 |
| Pittsburgh | .20 | 5.80–5.81 | 6.65 | 7.90 | 5.94–5.97 | ..... | 5.95–6.00 | 5.95 | 5.83 | 6.66–6.90 | ..... | 10.65 | ..... | 12.65 |
| Portland | .20 | 7.80 | 9.05 | 9.15–9.75 | 7.60 | ..... | 7.30 | 7.30 | 7.35 | 9.40 | ..... | ..... | ..... | ..... |
| Salt Lake City | .20 | 8.30 | ..... | 10.90[3] | 8.45 | ..... | 7.85 | 8.00 | 8.40 | 9.35[4] | ..... | ..... | ..... | ..... |
| San Francisco | .15 | 6.90 | 8.20 | 9.50 | 6.75 | 9.25–9.70 | 6.75 | 6.50 | 6.65 | 8.40–8.70 | ..... | 12.05 | ..... | 14.00 |
| Seattle | .20 | 7.16–7.36 | 8.24–8.84 | 9.20–9.50 | 7.20–7.45 | ..... | 7.04–7.19 | 6.63–6.83 | 6.88–7.08 | 9.37–9.42 | ..... | 11.70 | ..... | 13.70 |
| St. Louis | .20 | 6.10–6.11 | 6.94–6.95 | 8.20 | 6.14 | 8.27–8.39 | 6.35–6.40 | 6.35 | 6.13 | 6.96–7.21 | 10.65 | 10.95 | 12.65 | 12.95 |
| St. Paul | .15 | 6.47 | 7.31–7.61 | 8.61 | 6.50 | ..... | 6.61–6.66 | 6.61 | 6.49 | 7.32–7.57 | ..... | 11.31 | ..... | ..... |

# New key to Western progress

Production of Wide Flange Beams by Kaiser Steel—the first produced west of the Mississippi—is a new key factor in the expansion of western industry.

For western construction men now have a *dependable, nearby* source of supply for this vital structural shape.

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IRON AGE

# STEEL PRICES

*(Effective Apr. 14, 1953)*

*Italics* identify producers listed in key at end of table  Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | INGOTS | | BILLETS, BLOOMS, SLABS | | | PIPE SKELP | PIL-ING | SHAPES STRUCTURALS | | STRIP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Forging Net Ton | Alloy Net Ton | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | | Sheet Steel | Carbon | Hi Str. Low Alloy | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Alloy |
| EAST | Bethlehem, Pa. | | | | | $76.00 *B3* | | | 3.90 *B3* | 5.80 *B3* | | | | |
| | Buffalo, N. Y. | | | $59.00 *B3* | $70.50 *B3, R3* | $76.00 *B3, R3* | | 4.675 *B3* | 3.90 *B3* | 5.80 *B3* | 3.725 *B3, R3* | 5.10 *B3* | 5.70 *B3* | 7.90 |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | | | | $77.50 *A2* | $83.00 *A2* | | | | | 4.125 *A2* | | 5.90 *A2* | |
| | Harrisburg, Pa. | | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | | |
| | Johnstown, Pa. | | | $59.00 *B3* | $70.50 *B3* | $76.00 *B3* | | | 3.90 *B3* | 5.80 *B3* | 3.725 *B3* | | | |
| | Newark, N. J. | | | | | | | | | | | | | |
| | New Haven, Conn. | | | | | | | | | | | 5.60 *A5*<br>5.85 *D1* | | |
| | Phoenixville, Pa. | | | | | | | | 4.95 *P2* | | | | | |
| | Putnam, Conn. | | | | | | | | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | | | 3.725 *B3* | 5.10 *B3* | 5.70 *B3* | 7.90 |
| | Worcester, Mass. | | | | | | | | | | | | | |
| | Trenton, N. J. | | | | | | | | | | | 6.45 *R4* | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | | 4.20 *L1* | | | |
| | Ashland, Ky. | | | | | | | | | | 3.725 *A7* | | | |
| | Canton-Massillon, Ohio | | | | $70.50 *R3* | $76.00 *R3*<br>$78.60 *T5* | | | | | | | | |
| | Chicago, Sterling, Ill. | | | $59.00 *U1* | $70.50 *U1, R3, W8* | $76.00 *U1, R3, W8* | | 4.675 *U1* | 3.85 *U1, W8* | 5.80 *U1* | 3.725 *A1, W8*<br>4.725 *N4* | 5.35 *A1* | | |
| | Cleveland, Ohio | | | | $70.50 *R3* | | | | | | | 5.10 *A5, J3* | | 7.45 |
| | Detroit, Mich. | $56.00 *R5* | $57.00 *R5* | | $73.50 *R5* | $79.00 *R5* | | | | | 4.025 *G3*<br>4.40 *M2* | 5.30 *G3*<br>5.45 *M2*<br>5.60 *D1*<br>6.05 *D2* | 6.30 *G3* | 8.15 |
| | Duluth, Minn. | | | | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | | | $59.00 *U1* | $70.50 *U1* | $76.00 *U1, Y1* | | 4.675 *I3* | 3.85 *I3, U1* | 5.80 *I3, U1*<br>6.30 *Y1* | 3.725 *I3, U1, Y1* | 5.35 *I3* | 5.65 *I3, U1*<br>6.15 *Y1* | |
| | Granite City, Ill. | | | | | | | | | | | | | |
| | Kokomo, Ind. | | | | | | | | | | | | | |
| | Middletown, Ohio | | | | | | | | | | | 5.10 *A7* | | |
| | Niles, Ohio<br>Sharon, Pa. | | | | | | | | | | 4.225 *S1* | 5.70 *T4*<br>5.80 *S1* | 5.65 *S1* | 7.30 |
| | Pittsburgh, Pa.<br>Midland, Pa. | $54.00 *U1* | $57.00 *U1, C11* | $59.00 *U1* | $70.50 *U1* | $76.00 *U1, C11* | 3.55 *U1*<br>3.65 *J3* | 4.675 *U1* | 3.85 *U1, J3* | 5.80 *U1, J3* | 3.725 *A7*<br>3.975 *A3*<br>4.225 *S7, S9* | 5.10 *J3, A7*<br>5.45 *A3*<br>5.80 *B4, S7* | 7.45 *J3* | |
| | Portsmouth, Ohio | | | | | | | | | | | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | | | | 4.10 *W3* | | 3.825 *W3* | 5.10 *W3* | 6.10 *W3* | 7.95 |
| | Youngstown, Ohio | | | | | $76.00 *Y1, C10* | 3.55 *U1, R3* | | | 6.30 *Y1* | 3.725 *U1, Y1, R3* | 5.10 *R3, Y1*<br>5.70 *C5*<br>5.80 *B4* | 5.65 *R3, U1*<br>6.15 *Y1* | 7.30<br>7.80 |
| WEST | Fontana, Cal. | $81.00 *K1* | $83.00 *K1* | $78.00 *K1* | $89.50 *K1* | $95.00 *K1* | | | 4.50 *K1* | 6.45 *K1* | 5.175 *K1* | 6.75 *K1* | 6.55 *K1* | |
| | Geneva, Utah | | | | $70.50 *C7* | | | | 3.85 *C7* | 5.80 *C7* | | | | |
| | Kansas City, Mo. | | | | | | | | 4.45 *S2* | | 4.325 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | $89.50 *B2* | $96.00 *B2* | | | 4.45 *C7, B2* | 6.35 *B2* | 4.475 *C7, B2* | 7.15 *C1* | 6.40 *B2* | |
| | Minnequa, Colo. | | | | | | | | 4.30 *C6* | | 4.775 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | | | $89.50 *B2* | | | | 4.40 *B2*<br>4.56 *P9* | 6.30 *B2* | 4.475 *C7, B2* | | 6.40 *B2* | |
| | Seattle, Wash. | | | | $89.50 *B2* | | | | 4.50 *B2* | 6.40 *B2* | 4.725 *B2* | | 6.65 *B2* | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | 4.275 *A8* | | | |
| | Fairfield, Ala.<br>Alabama City, Ala. | | | $59.00 *T2* | 70.50 *T2* | | | | 3.85 *T2, R3* | 5.80 *T2* | 3.725 *T2, R3* | | 5.65 *T2* | |
| | Houston, Texas | | $65.00 *S2* | | $78.50 *S2* | $84.00 *S2* | | | 4.25 *S2* | | 4.125 *S2* | | | |

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

# STEEL PRICES

*(Effective Apr. 14, 1953)*

| SHEETS | | | | | | | | | WIRE ROD | TINPLATE† | | BLACK PLATE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ...rolled 10 ga. h hvyr. | Cold-rolled | Galvanized 10 ga. | Enameling 12 ga. | Long Terne 10 ga. | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot-rolled 19 ga. | | Cokes* 1.25-lb. base box | Electro* 0.25-lb. base box | Holloware Enameling 29 ga. | |
| | | | | | | | | | | | | | Bethlehem, Pa. |
| ...75 *B3* | 4.575 *B3* | | | | 5.675 *B3* | 6.925 *B3* | | | | | | | Buffalo, N. Y. |
| | | | | | | | | | | † Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢. | | | Claymont, Del. |
| | | | | | | | | | | | | | Coatesville, Pa. |
| ...75 *A2* | | | | | 5.925 *A2* | | | | | | | | Conshohocken, Pa. |
| | | | | | | | | | | | | | Harrisburg, Pa. |
| | | | | | | | | | | | | | Hartford, Conn. |
| | | | | | | | | | 4.325 *B3* | | | | Johnstown, Pa. |
| | | | | | | | | | | | | | Newark, N. J. |
| | | | | | | | | | | | | | New Haven, Conn. |
| | | | | | | | | | | | | | Phoenixville, Pa. |
| | | | | | | | | | | | | | Putnam, Conn. |
| ...75 *B3* | 4.575 *B3* | 5.075 *B3* | | | 5.675 *B3* | 6.925 *B3* | 7.775 *B3* | | 4.425 *B3* | $8.80 *B3* | $7.50 *B3* | | Sparrows Pt., Md. |
| | | | | | | | | | 4.625 *A5* | | | | Worcester, Mass. |
| | | | | | | | | | 4.425 *R4* | | | | Trenton, N. J. |
| | | | | | | | | | 4.70 *L1* | | | | Alton, Ill. |
| ...75 *A7* | | 5.075 *A7* | 4.925 *A7* | | | | | | | | | | Ashland, Ky. |
| | | 5.075 *R3* | | | | | | | | | | | Canton-Massillon, Ohio |
| ...75 *W8* | | | | | 5.675 *U1* | | | | 4.325 *A5, N4, R3* | | | | Chicago, Ill. |
| | | | | | | | | | 4.425 *N4* | | | | Sterling, Ill. |
| ...75 *R3, J3* | 4.575 *R3, J3* | | 4.925 *R3* | | 5.675 *R3, J3* | 6.925 *R3, J3* | | | 4.325 *A5* | | | | Cleveland, Ohio |
| ...75 *G3* | 4.775 *G3* | | | | 6.225 *G3* | 7.475 *G3* | | | | | | | Detroit, Mich. |
| | | | | | | | | | | | | | Duluth, Minn. |
| ...75 *I3, U1, Y1* | 4.575 *I3, U1, Y1* | 5.075 *I3, U1* | 4.925 *U1* | 5.475 *U1* | 5.675 *I3, U1* 6.175 *Y1* | 6.925 *I3, U1* 7.425 *Y1* | | | | $8.70 *U1, I3, Y1* | $7.40 *U1, I3* | 6.10 *U1, Y1* | Gary, Ind. Harbor, Indiana |
| ...50 *G2* | 5.275 *G2* | 5.275 *G2* | 5.625 *G2* | | | | | | | | $7.60 *G2* | 6.30 *G2* | Granite City, Ill. |
| | | 5.475 *C9* | | | | | | | | | | | Kokomo, Ind. |
| | 4.575 *A7* | | 4.925 *A7* | 5.475 *A7* | | | | | | | | | Middletown, Ohio |
| ...75 *S1* | | | | | 5.675 *S1* | | | | | | $7.40 *R3* | | Niles, Ohio Sharon, Pa. |
| ...75 *U1, J3, A7* ...25 *A3* | 4.575 *U1, J3, A7* | 5.075 *U1* | 4.925 *U1* | | 5.675 *U1, J3* | 6.925 *U1, J3* | 7.625 *U1* | | 4.325 *A5* 4.525 *P6* | $8.70 *U1, J3* | $7.40 *U1, J3* | 6.10 *U1* | Pittsburgh, Pa. Midland, Pa. |
| | | | | | | | | | 4.525 *P7* | | | | Portsmouth, Ohio |
| ...75 *W3, W5* | 4.575 *W3, W5* | 5.075 *W3, W5* | | 5.475 *W3, W5* | 6.025 *W3* | 7.275 *W3* | | | | $8.70 *W3, W5* | $7.40 *W3, W5* | 6.35 *W5* | Weirton, Wheeling, Follansbee, W. Va. |
| ...75 *U1, R3, Y1* | 4.575 *R3, Y1* | 5.775 *R1* | 4.925 *Y1* | 6.05 *E2* | 5.675 *R3, U1* 6.175 *Y1* | 6.925 *R3* 7.425 *Y1* | | 5.65 *E2* 5.825 *R1* | 4.325 *Y1* | $8.70 *R3* | | | Youngstown, Ohio |
| ...25 *K1* | 5.675 *K1* | | | | 6.775 *K1* | 7.875 *K1* | | | 5.125 *K1* | | | | Fontana, Cal. |
| ...75 *C7* | | | | | | | | | | | | | Geneva, Utah |
| | | | | | | | | | | | | | Kansas City, Mo. |
| ...75 *C7* | | 5.825 *C7* | | | | | | 5.575 *C7* | 5.125 *C7, B2* | | | | Los Angeles, Torrance, Cal. |
| | | | | | | | | | 4.575 *C6* | | | | Minnequa, Colo. |
| ...75 *C7* | 5.525 *C7* | 5.825 *C7* | | | | | | | 4.975 *C7* | $9.45 *C7* | $8.15 *C7* | | San Francisco, Niles, Pittsburg, Cal. |
| | | | | | | | | | | | | | Seattle, Wash. |
| | | | | | | | | | | | | | Atlanta, Ga. |
| ...75 *T2, R3* | 4.575 *T2* | 5.075 *T2, R3* | | | 5.675 *T2* | | | 4.925 *R3* | 4.325 *T2, R3* | $8.80 *T2* | $7.50 *T2* | | Fairfield, Ala. Alabama City, Ala. |
| | | | | | | | | | 4.725 *S2* | | | | Houston, Tex. |

# STEEL PRICES

*(Effective Apr. 14, 1953)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Steel | Reinforcing (To Fabricators) | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr's. Bright |
| EAST | Bethlehem, Pa. | | | | 4.675 *B3* | 6.00 *B3* | 5.925 *B3* | | | | | |
| | Buffalo, N. Y. | 3.95 *B3, R3* | 3.95 *B3, R3* | 4.975 *B5* | 4.675 *B3, R3* | 6.00 *B3, B5* | 5.925 *B3* | 3.90 *B3* | | | 5.95 *B3* | |
| | Claymont, Del. | | | | | | | 4.35 *C4* | | 5.35 *C4* | | |
| | Coatesville, Pa. | | | | | | | 4.35 *L4* | | 5.75 *L4* | | |
| | Conshohocken, Pa. | | | | | | | 4.35 *A2* | 4.95 *A2* | | 6.20 *A2* | |
| | Harrisburg, Pa. | | | | | | | 6.50 *C3* | 6.50 *C3* | | | |
| | Hartford, Conn. | | | 5.475 *R3* | | 6.45 *R3* | | | | | | |
| | Johnstown, Pa. | 3.95 *B3* | 3.95 *B3* | | 4.675 *B3* | | 5.925 *B3* | 3.90 *B3* | | 5.25 *B3* | 5.95 *B3* | 5.225 *B3* |
| | Newark, N. J. | | | 5.375 *W10* | | 6.35 *W10* | | | | | | |
| | New Haven, Conn. | | | | | | | | | | | |
| | Camden, N. J. | | | 5.375 *P10* | | 6.35 *P10* | | | | | | |
| | Putnam, Conn. | | | 5.475 *W10* | | | | | | | | |
| | Sparrows Pt., Md. | | 3.95 *B3* | | | | | 3.90 *B3* | | 5.25 *B3* | 5.95 *B3* | 5.325 *B3* |
| | Worcester, Mass. | | | | | 6.35 *A5* | | | | | | 5.525 *A5* |
| | Trenton, N. J. | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | 4.50 *L1* | | | | | | | | | | 5.45 *L1* |
| | Ashland, Ky. | | | | | | | 3.90 *A7* | | | | |
| | Canton-Massillon | 3.95 *R3* | | 4.925 *R2, R3* | 4.675 *R3*<br>4.72 *T5* | 5.99 *T5*<br>6.00 R2, R3 | | | | | | |
| | Chicago, Ill. | 3.95 *U, W8, R3*<br>4.55 *N4* | 3.95 *R3*<br>4.70 *N4* | 4.925 *A5, B5 W8, W10* | 4.675 *R3, U1, W8* | 6.00 *B5, L2, R3, W8, W10*<br>6.05 *A5* | | 3.90 *U1, W8* | 4.95 *U1* | 5.25 *U1* | 5.95 *U1* | 5.225 *A3, N4, R3*<br>5.325 *K2*<br>5.475 *W7* |
| | Cleveland, Ohio | 3.95 *R3* | 3.95 *R3* | 4.925 *A5, C13* | | 6.00 *C13*<br>6.05 *A5* | 5.925 *R3* | 3.90 *R3, J3* | 4.95 *J3* | | 5.95 *R3, J3* | 5.225 *A5, C13, R3* |
| | Detroit, Mich | 4.10 *R5*<br>4.30 *G3* | | 5.075 *R5, P8*<br>5.175 *P3* | 4.825 *R5*<br>5.025 *G3* | 6.15 *R5, P8*<br>6.20 *P3* | 6.675 *G3* | 4.45 *G3* | | | 6.90 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 5.252 *A5* |
| | Gary, Ind. Harbor, Crawfordsville, Indiana | 3.95 *I3, U1, Y1* | 3.95 *I3, U1, Y1* | 4.925 *L2, M5, R3* | 4.675 *I3, U1, Y1* | 6.00 *L2, M5, R3, R5* | 5.925 *I3, U1,*<br>6.425 *Y1* | 3.90 *I3, U1, Y1* | 4.95 *I3* | 5.25 *U1* | 5.95 *I3, U1,*<br>6.45 *Y1* | 5.325 *M4* |
| | Granite City, Ill. | | | | | | | 4.60 *G2* | | | | |
| | Kokomo, Ind. | | | | | | | | | | | 5.325 *C9* |
| | Sterling, Ill. | | 4.80 *N4* | | | | | | | | | 5.325 *N4* |
| | Niles, Ohio<br>Sharon, Pa. | | | | | | | 4.15 *S1* | | 5.70 *S1* | 5.95 *S1* | |
| | Pittsburgh, Pa.<br>Midland, Pa. | 3.95 *U1, J3* | 3.95 *U1, J3* | 4.925 *A5, J3, W10, R3, C8* | 4.675 *U1, C11* | 6.00 *C8, C11, W10*<br>6.05 *A5* | 5.925 *U1, J3* | 3.90 *U1, J3* | 4.95 *U1* | 5.25 *U1* | 5.95 *U1, J3* | 5.225 *A5, J3*<br>5.475 *P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 5.625 *P7* |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.10 *W3* | | | | | | 3.90 *W5*<br>4.20 *W3* | | | | |
| | Youngstown, Ohio | 3.95 *U1, Y1, R3* | 3.95 *U1, Y1, R3* | 4.925 *F2, Y1* | 4.675 *U1, C10, Y1* | 6.00 *C10, F2, Y1* | 5.925 *U1*<br>6.425 *Y1* | 3.90 *U1, Y1, R3* | | | 5.95 *R3*<br>6.45 *Y1* | 5.225 *Y1* |
| WEST | Fontana, Cal. | 4.65 *K1* | 4.65 *K1* | | 5.725 *K1* | | 6.975 *K1* | 4.55 *K1* | | 6.20 *K1* | 6.65 *K1* | |
| | Geneva, Utah | | | | | | | 3.90 *C7* | | | 5.95 *C7* | |
| | Kansas City, Mo. | 4.55 *S2* | 4.55 *S2* | | 5.275 *S2* | | | | | | | 5.825 *S1* |
| | Los Angeles, Torrance, Cal. | 4.65 *C7, B2* | 4.65 *C7, B2* | 6.375 *R3* | 5.725 *B2* | | 6.625 *B2* | | | | | 6.175 *C7, B1* |
| | Minnequa, Colo. | 4.40 *C6* | 4.75 *C6* | | | | | 4.70 *C6* | | | | 5.475 *C6* |
| | San Francisco, Niles, Pittsburg, Cal. | 4.65 *C7, P9*<br>4.70 *B2* | 4.65 *C7, P9*<br>4.70 *B2* | | | | 6.675 *B2* | | | | | 6.175 *C6, C7* |
| | Seattle, Wash. | 4.70 *B2* | 4.70 *B2* | | | | 6.675 *B2* | 4.80 *B2* | | | 6.85 *B2* | |
| SOUTH | Atlanta, Ga. | 4.50 *A8* | 4.50 *A8* | | | | | | | | | 5.475 *A8* |
| | Fairfield, Ala.<br>Alabama City, Ala. | 3.95 *T2, R3* | 3.95 *T2, R3* | | | | 5.925 *T2* | 3.90 *T2, R3* | | | 5.95 *T2* | 5.225 *T2, R3* |
| | Houston, Texas<br>Ft. Worth, Texas | 4.35 *S2* | 4.35 *S2*<br>5.05 *T7* | | 5.075 *S2* | | | 4.30 *S2* | | | | 5.625 *S2* |

# Steel Prices

*(Effective Apr. 14, 1953)*

## Key to Steel Producers

With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angell Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, O.
*A8* Atlantic Steel Co., Atlanta, Ga.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Pacific Coast Steel Corp., San Francisco
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C3* Central Iron & Steel Co., Harrisburg, Pa.
*C4* Claymont Products Dept., Claymont, Del.
*C5* Cold Metal Products Co., Youngstown
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia-Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Glassport, Pa.
*C11* Crucible Steel Co. of America, New York
*C12* Cumberland Steel Co., Cumberland, Md.
*C13* Cuyahoga Steel & Wire Co., Cleveland

*D1* Detroit Steel Corp., Detroit
*D2* Detroit Tube & Steel Div., Detroit
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire Steel Co., Mansfield, O.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G1* Globe Iron Co., Jackson, O.
*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit

*H1* Hanna Furnace Corp., Detroit

*I2* Ingersoll Steel Div., Chicago
*I3* Inland Steel Co., Chicago
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Jorlyn Mfg. & Supply Co., Chicago

*K1* Kaiser Steel Corp., Fontana, Cal.
*K2* Keystone Steel & Wire Co., Peoria
*K3* Koppers Co., Granite City, Ill.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid-States Steel & Wire Co., Crawfordsville, Ind.
*M5* Monarch Steel Co., Inc., Hammond, Ind.
*M6* Mystic Iron Works, Everett, Mass.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Co., Pittsburgh
*N3* Niles Rolling Mills Co., Niles, O.
*N4* Northwestern Steel & Wire Co., Sterling, Ill.

*O1* Oliver Iron & Steel Co., Pittsburgh

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Iron & Steel Co., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P5* Pittsburgh Screw & Bolt Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.

*R1* Reeves Stee & Mfg. Co., Dover, O.
*R2* Reliance Div. Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co. (John A.), Trenton, N. J.
*R5* Rotary Electric Steel Co., Detroit

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Corp., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw & Steel Co., Fitchburg, Mass.
*S5* Sloss Sheffield Steel & Iron Co., Birmingham
*S6* Standard Forging Corp., Chicago
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Corp., Carnegie, Pa.
*S10* Swest's Steel Co., Williamsport, Pa.
*S11* Seidelhuber Steel Rolling Mills, Seattle

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T6* Tremont Nail Co., Wareham, Mass.
*T7* Texas Steel Co. Ft. Worth

*U1* United States Steel Co., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago
*W8* Wisconsin Steel Co., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh

*Y1* Youngstown Sheet & Tube Co., Youngstown

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails ¢/Cwl | Woven Wire Fence 9-15½ ga. ¢/Cwl | Fence Posts ¢/Cwl | Single Loop Bale Ties ¢/Cwl | Twisted Barbless Wire ¢/Cwl | Galv. Barbed Wire ¢/Cwl | Merch. Wire Annld ¢/lb. | Merch. Wire Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|---|
| Alabama City *R3*† | 127 | 135 | ... | 132 | ... | 144 | 6.075 | 6.325 |
| Aliquippa, Pa. *J3* | 127 | 141 | ... | ... | ... | 148 | 6.075 | 6.525 |
| Atlanta *A8* | 130 | 140 | ... | 135 | ... | 149 | 6.325 | 6.675 |
| Bartonville *K2* | 127 | 139 | 140 | 132 | 148 | 148 | 6.075 | 6.50 |
| Buffalo *W6* | | | | | | | | |
| Chicago *N4* | 127 | 136 | ... | 132 | 145 | 145 | 6.075 | 6.375 |
| Cleveland *A6* | | | | | | | | |
| Cleveland *A5* | | | | | | | 6.075 | 6.225 |
| Crawfordsville *M4* | 127 | 138 | ... | 132 | ... | 147 | 6.175 | 6.475 |
| Donora, Pa. *A5* | 127 | 133 | ... | 132 | 142 | 142 | 6.075 | 6.225 |
| Duluth *A5* | 127 | 133 | ... | 132 | 142 | 142 | 6.075 | 6.225 |
| Fairfield, Ala. *T2* | 127 | 133 | ... | 132 | 142 | 142 | 6.075 | 6.225 |
| Galveston *D4* | 135 | | | | | | | |
| Houston *S2* | 135 | 147 | | | | 156 | 6.475 | 6.925 |
| Johnstn., Pa. *B3* | 127 | ... | 148 | ... | 149 | | | 6.575 |
| Joliet, Ill. *A5* | 127 | 133 | ... | 132 | 142 | 142 | 6.075 | 6.225 |
| Kokomo, Ind. *C9* | ... | ... | 142 | ... | ... | ... | 6.175 | 6.425 |
| Los Angeles *B2* | | | | | | | 7.025 | |
| Kansas City *S2* | 139 | ... | ... | 144 | ... | 160 | 6.075 | 7.125 |
| Minnequa *C6* | 132 | 146 | 138 | 137 | ... | 153 | 6.325 | 6.70 |
| Moline, Ill. *R3* | | | 136 | | | | | |
| Pittsburg, Cal. *C7* | 146 | 156 | ... | 156 | 162 | 162 | 7.025 | 7.175 |
| Monessen *P6* | 127 | 138 | ... | ... | 147 | 147 | 6.075 | 6.45 |
| Portsmouth *P7* | 132 | ... | ... | ... | ... | ... | 6.47 | ... |
| Rankin, Pa. *A5* | 127 | 133 | ... | ... | 142 | 142 | 6.075 | 6.225 |
| So. Chicago *R3*† | 127 | 135 | 140 | 132 | ... | 144 | 6.075 | 6.325 |
| S. San Fran. *C6* | ... | ... | ... | 153 | ... | 167 | 7.025 | 7.40 |
| Sparrows Pt. *B3* | 129 | ... | ... | 134 | 151 | ... | ... | 6.675 |
| Struthers, O. *Y1*‡ | ... | ... | ... | ... | ... | ... | 6.075 | 6.475 |
| Torrance, Cal. *C7* | 147 | ... | ... | ... | ... | ... | 7.025 | ... |
| Worcester *A5* | 133 | ... | ... | ... | ... | ... | 6.375 | 6.525 |
| Williamsport, Pa. *S10* | ... | ... | ... | ... | ... | ... | ... | ... |

**Cut Nails, carloads base $7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (*A2*) Wheeling, W. Va (*W5*) $7.80.**

† Zinc extra not included on Galv. Merch. Wire.

‡ Struthers Galv. Merch. Wire based on 15¢ Zinc.

## STAINLESS STEELS

**Base price, cents per lb., f.o.b. mill.**

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, rerolling | 15.50 | 16.50 | 18.00 | 17.50 | 26.75 | 21.75 | 23.50 | 13.50 | 16.25 | 13.75 |
| Slabs, billets, rerolling | 19.75 | 21.75 | 23.75 | 22.75 | 34.75 | 28.25 | 30.75 | 17.50 | 21.50 | 17.75 |
| Forg. discs, die blocks, rings | 36.75 | 37.00 | 39.75 | 38.50 | 57.25 | 43.50 | 48.25 | 30.00 | 30.50 | 30.50 |
| Billets, forging | 28.25 | 28.50 | 30.75 | 29.75 | 44.75 | 33.75 | 37.75 | 23.00 | 23.50 | 23.50 |
| Bars, wires, structurals | 33.75 | 34.00 | 36.50 | 35.50 | 53.00 | 40.00 | 44.75 | 27.50 | 28.00 | 28.00 |
| Plates | 35.75 | 35.75 | 38.00 | 38.00 | 56.00-56.25 | 44.00 | 49.00 | 28.75 | 29.75 | 29.25 |
| Sheets | 44.25 | 44.50 | 46.50 | 46.50 | 61.50 | 53.00 | 58.00 | 39.00 | 39.50 | 41.50 |
| Strip, hot-rolled | 28.50 | 30.50 | 35.00 | 32.75 | 52.50 | 40.00 | 44.50 | 25.00 | 32.75 | 25.75 |
| Strip, cold-rolled | 36.50 | 39.75 | 43.50 | 41.75 | 63.50 | 52.00 | 56.50 | 32.75 | 39.50 | 33.25 |

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*

*Strip:* Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa. *W2* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7* Wallingford, Conn., *W1*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y. *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne, *J4.*

*Wires:* Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1);* Syracuse, *C11;* Bridgeville, *U2.*

*Structurals:* Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

*Plates:* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*

*Forged discs, die blocks, rings:* Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

*Forging billets:* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

# Miscellaneous Prices

*(Effective Apr. 14, 1953)*

## PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½–3 In. | | 2 In. | | 2½–3 In. | | 3½–4 In. | |
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| **STANDARD T. & C.** | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 30.5 | 8.25 | 33.5 | 12.25 | 35.5 | 15.75 | 36.5 | 16.25 | 37.0 | 17.25 | 37.5 | 17.75 | 38.0 | 18.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 32.5 | 10.25 | 35.5 | 14.25 | 38.0 | 17.75 | 38.5 | 18.25 | 39.0 | 19.25 | 39.5 | 19.75 | 40.0 | 20.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | 19.5 | +2.75 | 22.5 | 1.25 | 25.0 | 4.75 | 25.5 | 5.25 | 26.0 | 6.25 | 26.5 | 6.75 | 27.0 | 7.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 32.5 | 10.25 | 35.5 | 13.25 | 38.0 | 15.75 | 38.5 | 16.75 | 39.0 | 17.25 | 39.5 | 17.75 | 40.0 | 18.75 | 24.0 | 2.25 | 27.0 | 5.75 | 29.0 | 7.75 |
| Alton, Ill. *L1* | 31.5 | 9.25 | 34.5 | 13.25 | 37.0 | 16.75 | 37.5 | 17.25 | 38.0 | 18.25 | 38.5 | 18.75 | 39.0 | 19.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 32.5 | 9.25 | 35.5 | 13.25 | 38.0 | 16.25 | 38.5 | 16.75 | 39.0 | 17.25 | 39.5 | 17.75 | 40.0 | 18.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 32.5 | 10.25 | 35.5 | 14.25 | 38.0 | 17.75 | 38.5 | 18.25 | 39.0 | 19.25 | 39.5 | 19.75 | 40.0 | 20.25 | 24.0 | ..... | 27.0 | ..... | 29.0 | ..... |
| Wheeling *W5* | 32.5 | 10.25 | 35.5 | 14.25 | 38.0 | 17.75 | 38.5 | 18.25 | 39.0 | 19.25 | 39.5 | 19.75 | 40.0 | 20.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 32.5 | 10.25 | 35.5 | 13.25 | 38.0 | 15.75 | 38.5 | 16.75 | 39.0 | 17.25 | 39.5 | 17.75 | 40.0 | 18.75 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 32.5 | 10.25 | 35.5 | 14.25 | 38.0 | 17.75 | 38.5 | 18.25 | 39.0 | 19.25 | 39.5 | 19.75 | 40.0 | 20.25 | 24.0 | 3.75 | 27.0 | 6.75 | 29.0 | 8.75 |
| Indiana Harbor *Y1* | 31.5 | 9.25 | 34.5 | 13.25 | 37.0 | 16.75 | 37.5 | 17.25 | 38.0 | 18.25 | 38.5 | 18.75 | 39.0 | 19.25 | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 32.5 | 15.25 | 35.5 | 14.25 | 38.0 | 17.75 | 38.5 | 18.25 | 39.0 | 19.25 | 39.5 | 19.75 | 40.0 | 20.25 | 24.0 | 3.75 | 27.0 | 6.75 | 29.0 | 8.75 |
| **EXTRA STRONG PLAIN ENDS** | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 30.25 | 9.5 | 34.25 | 13.5 | 36.25 | 17.0 | 36.75 | 17.5 | 37.25 | 18.5 | 37.75 | 19.0 | 38.25 | 19.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 32.25 | 11.5 | 36.25 | 15.5 | 38.25 | 19.0 | 38.75 | 19.5 | 39.25 | 20.5 | 39.75 | 21.0 | 40.25 | 21.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | 19.25 | ..... | 23.25 | ..... | 25.25 | ..... | 25.75 | ..... | 26.25 | ..... | 26.75 | ..... | 27.25 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 32.25 | 10.0 | 36.25 | 14.0 | 38.25 | 16.0 | 38.75 | 17.0 | 39.25 | 17.5 | 39.75 | 18.0 | 40.25 | 19.0 | 23.75 | 2.0 | 27.75 | 6.5 | 31.25 | 10.0 |
| Alton, Ill. *L1* | 29.25 | 8.5 | 33.25 | 12.5 | 35.25 | 16.0 | 35.75 | 16.5 | 36.25 | 17.5 | 36.75 | 18.0 | 37.25 | 18.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 32.25 | 10.5 | 36.25 | 14.5 | 38.25 | 17.5 | 38.75 | 18.0 | 39.25 | 18.5 | 39.75 | 19.0 | 40.25 | 19.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 32.25 | 11.5 | 36.25 | 15.5 | 38.25 | 19.0 | 38.75 | 19.5 | 39.25 | 20.5 | 39.75 | 21.0 | 40.25 | 21.5 | 23.75 | ..... | 27.75 | ..... | 31.25 | ..... |
| Wheeling *W5* | 32.25 | 11.5 | 36.25 | 15.5 | 38.25 | 19.0 | 38.75 | 19.5 | 39.25 | 20.5 | 39.75 | 21.0 | 40.25 | 21.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 32.25 | 10.0 | 36.25 | 14.0 | 38.25 | 16.0 | 38.75 | 17.0 | 39.25 | 17.5 | 39.75 | 18.0 | 40.25 | 19.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 32.25 | 11.5 | 36.25 | 15.5 | 37.75 | 19.0 | 38.75 | 19.5 | 39.25 | 20.5 | 39.75 | 21.0 | 40.25 | 22.5 | 23.75 | 4.5 | 27.75 | 8.5 | 31.25 | 12.0 |
| Indiana Harbor *Y1* | 31.25 | 10.5 | 35.25 | 14.5 | 37.25 | 17.5 | 37.75 | 18.5 | 38.25 | 19.5 | 38.75 | 20.0 | 39.25 | 20.5 | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 32.25 | 11.5 | 36.25 | 15.5 | 38.25 | 19.0 | 38.75 | 19.5 | 39.25 | 20.5 | 39.75 | 21.0 | 40.25 | 21.5 | 23.75 | 4.5 | 27.75 | 8.5 | 31.25 | 12.0 |

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes ½¢. Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbors' discount, 5 pct. St. Louis zinc price now 11.0¢.

## COKE

| | Net-Ton |
|---|---|
| **Furnace, beehive (f.o.b. oven)** | |
| Connellsville, Pa. | $14.50 to $15.00 |
| **Foundry, beehive (f.o.b. oven)** | |
| Connellsville, Pa. | $16.50 to $18.00 |
| **Foundry, oven coke** | |
| Buffalo, del'd | $28.08 |
| Chicago, f.o.b. | 24.50 |
| Detroit, f.o.b. | 25.50 |
| New England, del'd | 26.05 |
| Seaboard, N. J., f.o.b. | 24.00 |
| Philadelphia, f.o.b. | 23.96 |
| Swedeland, Pa., f.o.b. | 23.85 |
| Painesville, Ohio, f.o.b. | 24.00 |
| Erie, Pa., f.o.b. | 26.00 |
| Cleveland, del'd | 27.43 |
| Cincinnati, del'd | 26.56 |
| St. Paul, f.o.b. | 22.50 |
| St. Louis, f.o.b. | 26.00 |
| Birmingham, del'd | 23.21 |
| Lone Star, Tex., f.o.b. | 18.50 |

## ELECTRICAL SHEETS

| 22 Ga. H-R cut length<br>F.o.b. Mill<br>Cents Per Lb. | Armature | Elec. | Motor | Dynamo | Transf. 72 | Transf. 65 | Transf. 58 |
|---|---|---|---|---|---|---|---|
| Beach Bottom *W5* | ..... | 7.85 | 9.10 | 9.90 | 10.45 | 11.00 | 11.70 |
| Brackenridge *A3* | 7.35 | 7.85 | 9.10 | 9.90 | 10.45 | 11.00 | 11.70 |
| Granite City *G2* | ..... | 8.55 | 9.80 | ..... | ..... | ..... | ..... |
| Ind. Harbor *I3* | 7.35 | 7.85 | 9.10 | ..... | ..... | ..... | ..... |
| Mansfield *E2* | 7.38 | 7.85 | 9.10 | 9.90 | ..... | ..... | ..... |
| Niles, O. *N3* | 7.35 | 7.85 | ..... | ..... | ..... | ..... | ..... |
| Vandergrift *U1* | 7.35 | 7.85 | 9.10 | 9.90 | 10.45 | 11.00 | 11.70 |
| Warren, O. *R3* | 7.38 | 7.85 | 9.10 | ..... | ..... | ..... | ..... |
| Zanesville *A7* | 7.38 | 7.85 | 9.10 | 9.90 | 10.45 | 11.00 | 11.70 |

## CAST IRON WATER PIPE

| | Per Net Ton |
|---|---|
| 6 to 24-in., del'd Chicago | $110.30 to $113.80 |
| 6 to 24-in., del'd N.Y. | 113.50 to 114.50 |
| 6 to 24-in., Birmingham | 96.50 to 101.00 |
| 6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less | $128.00 to $130.00 |

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

| Producing Point | Basic | Foundry | Malleable | Bessemer | Low Phos. | Bl. Furnace Silvery |
|---|---|---|---|---|---|---|
| Bethlehem *B3* | 56.50 | 57.00 | 57.50 | 58.00 | ..... | ..... |
| Birmingham *R3* | 50.88 | 51.38 | ..... | ..... | ..... | ..... |
| Birmingham *W9* | 50.88 | 51.38 | ..... | ..... | ..... | ..... |
| Birmingham *S5* | 50.88 | 51.38 | ..... | ..... | ..... | ..... |
| Buffalo *R3* | 54.50 | 55.00 | 55.50 | ..... | ..... | ..... |
| Buffalo *H1* | 54.50 | 55.00 | 55.50 | ..... | ..... | 66.75 |
| Buffalo *W6* | 54.50 | 55.00 | 55.50 | ..... | ..... | ..... |
| Chicago *I4* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Cleveland *A5* | 54.50 | 55.00 | 55.00 | 55.50 | 59.50 | ..... |
| Cleveland *R3* | 54.50 | 55.00 | 55.00 | ..... | ..... | ..... |
| Daingerfield, Tex. *L3* | 50.50 | 51.00 | 51.00 | ..... | ..... | ..... |
| Duluth *I4* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Erie *I4* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Everett, Mass. *M6* | ..... | 59.50 | 60.00 | ..... | ..... | ..... |
| Fontana *K1* | 60.50 | 61.00 | ..... | ..... | ..... | ..... |
| Geneva, Utah *C7* | 54.50 | 55.00 | ..... | ..... | ..... | ..... |
| Granite City, Ill. *K3* | 56.40 | 56.90 | 57.40 | ..... | ..... | ..... |
| Hubbard, Ohio *Y1* | 54.50 | 55.00 | 55.00 | ..... | ..... | ..... |
| Jackson, Ohio *J1,G1* | ..... | ..... | ..... | ..... | ..... | 65.50 |
| Minnequa *C6* | 56.50 | 57.50 | 57.50 | ..... | ..... | ..... |
| Monessen *P6* | 56.50 | ..... | ..... | ..... | ..... | ..... |
| Neville Island *P4* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Pittsburgh *U1* | 54.50 | ..... | ..... | 55.50 | ..... | ..... |
| Sharpsville *S3* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Steelton *B3* | 56.50 | 57.00 | 57.50 | 58.00 | 62.50 | ..... |
| Swedeland *A2* | 58.50 | 59.00 | 59.50 | 60.00 | ..... | ..... |
| Toledo *I4* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| Troy, N. Y. *R3* | 56.50 | 57.00 | 57.50 | 58.00 | 62.50 | ..... |
| Youngstown *Y1* | 54.50 | 55.00 | 55.00 | 55.50 | ..... | ..... |
| N. Tonawanda, N. Y. *T1* | ..... | 55.00 | 55.50 | ..... | ..... | ..... |

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton not for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

## BOILER TUBES

| $ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | Size B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. | Elec. Weld C.D. |
|---|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 23.93 | 28.14 | 23.19 | 27.38 |
| | 2½ | 12 | 32.17 | 37.83 | 31.19 | 36.67 |
| | 3 | 12 | 35.78 | 42 11 | 34.69 | 40.82 |
| | 3½ | 11 | 44.72 | 52.65 | 43.36 | 51.05 |
| | 4 | 10 | 55.52 | 65.31 | 53.83 | 63.32 |
| National Tube | 2 | 13 | 22.81 | 27.94 | 22.23 | ..... |
| | 2½ | 12 | 31.28 | 38.31 | 30.51 | ..... |
| | 3 | 12 | 35.87 | 43.93 | 34.96 | ..... |
| | 3½ | 11 | 42.56 | 52 12 | ..... | ..... |
| | 4 | 10 | 54.02 | 66.16 | ..... | ..... |
| Pittsburgh Steel | 2 | 13 | ..... | 28.58 | ..... | ..... |
| | 2½ | 12 | 32.10 | 39 19 | ..... | ..... |
| | 3 | 12 | 36.87 | 44.93 | ..... | ..... |
| | 3½ | 11 | 43.76 | 53 32 | ..... | ..... |
| | 4 | 10 | ..... | 67.68 | ..... | ..... |

## C-R SPRING STEEL

| Cents Per Lb. F.o.b. Mill | CARBON CONTENT 0.26–0.40 | 0.41–0.60 | 0.61–0.80 | 0.81–1.05 | 1.06–1.35 |
|---|---|---|---|---|---|
| Bridgeport, Conn. **S7* | 5.80 | 7.65 | 8.25 | 10.20 | 12.50 |
| Carnegie, Pa. *S9* | ..... | 7.65 | 8.25 | 10.20 | 12.50 |
| Cleveland *A5* | 5.10 | 7.30 | 8.25 | 10.20 | 12.50 |
| Detroit *D1* | 6.45 | 7.50 | 8.10 | ..... | ..... |
| New Castle, Pa. *B4* | 5.80 | 7.65 | 8.25 | 10.20 | ..... |
| New Haven, Conn. *D1* | 6.70 | 7.60 | 8.20 | 10.20 | 12.50 |
| Sharon, Pa. *S1* | 5.80 | 7.65 | 8.25 | 10.20 | 12.50 |
| Trenton, N. J. *R6* | ..... | 7.95 | 8.55 | 10.20 | 12.50 |
| Warren, Ohio *T4* | 6.20 | 7.65 | 8.25 | 10.20 | 12.50 |
| Weirton, W. Va. *W3* | 5.80 | 7.65 | 8.25 | 10.20 | 12.50 |
| Worcester, Mass. *A5* | 5.40 | 7.60 | 8.55 | 10.20 | 12.50 |
| Youngstown *C5* | ..... | 7.65 | 8.25 | 10.20 | 12.50 |

* Sold on Pittsburgh base.

## Miscellaneous Prices—

*(Effective Apr. 14, 1953)*

### RAILS, TRACK SUPPLIES

| f.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Screw Spikes | Tie Plates | Track Bolts Treated |
|---|---|---|---|---|---|---|---|
| Bessemer *UI* | 3.775 | 4.25 | 4.925 | .... | .... | .... | .... |
| Chicago *R3* | .... | .... | .... | 6.65 | .... | .... | .... |
| Cleveland *R3* | .... | .... | .... | .... | .... | .... | .... |
| Ensley *T2* | 3.775 | 4.25 | .... | .... | .... | .... | .... |
| Fairfield *T2* | .... | 4.25 | .... | 6.65 | .... | 4.775 | .... |
| Gary *UI* | 3.775 | 4.25 | .... | .... | .... | 4.775 | .... |
| Ind. Harbor *I3* | 3.775 | .... | 4.925 | 6.65 | .... | 4.775 | .... |
| Johnstown *B3* | .... | 4.25 | .... | .... | .... | .... | .... |
| Joliet *UI* | .... | 4.25 | 4.925 | .... | .... | .... | .... |
| Kansas City *S2* | .... | .... | .... | .... | .... | .... | .... |
| Lackawanna *B3* | 3.775 | 4.25 | 4.925 | .... | .... | 4.775 | .... |
| Lebanon *B3* | .... | .... | .... | 6.65 | .... | .... | .... |
| Minnequa *C6* | 3.775 | 4.75 | 4.925 | 6.65 | .... | 4.775 | 9.85 |
| Pittsburgh *R3* | .... | .... | .... | .... | .... | .... | .... |
| Pittsburgh *O1* | .... | .... | .... | .... | .... | .... | .... |
| Pittsburgh *P5* | .... | .... | .... | .... | .... | .... | .... |
| Pittsburgh *J3* | .... | .... | .... | 6.65 | .... | .... | .... |
| Pitt'g, Cal. *C7* | .... | .... | .... | .... | .... | 4.925 | .... |
| Seattle *B2* | .... | .... | .... | 7.15 | .... | 4.925 | .... |
| Steelton *B3* | 3.775 | .... | 4.925 | .... | .... | 4.775 | .... |
| Struthers *Y1* | .... | .... | .... | 6.65 | .... | .... | .... |
| Terrace *C7* | .... | .... | .... | .... | .... | 4.925 | .... |
| Youngstown *R3* | .... | .... | .... | 6.65 | .... | .... | .... |

### TOOL STEEL

*F.o.b. mill*

Add 4.7 pct to base and extras.

| W | Cr | V | Mo | Co | Base per lb |
|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.505 |
| 18 | 4 | 1 | — | 5 | $2.13 |
| 18 | 4 | 2 | — | — | $1.65 |
| 1.5 | 4 | 1.5 | 8 | — | 31.0¢ |
| 6 | 4 | 2 | 6 | — | 96.5¢ |

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

### CLAD STEEL

Add 4.7 pct to base and extras.

| | Plate | Sheet |
|---|---|---|
| Stainless-carbon | | |
| No. 304, 20 pct. | | |
| Coatesville, Pa. *L4* | *29.5 | |
| Washington, Pa. *J2* | *29.5 | |
| Claymont, Del. *C4* | *29.50 | |
| Conshohocken, Pa. *A2* | | *27.50 |
| New Castle, Ind. *I2* | *29.77 | *26.24 |
| Nickel-carbon | | |
| 10 pct Coatesville, Pa. *L4* | 32.5 | |
| Inconel-carbon | | |
| 10 pct Coatesville, Pa. *L4* | 40.5 | |
| Monel-carbon | | |
| 10 pct Coatesville, Pa. *L4* | 33.5 | |
| No. 302 Stainless copper stainless, Carnegie, Pa. *A4* | | 77.00 |
| Aluminized steel sheets, hot dip, Butler, Pa., *A7* | | 7.75 |

*Includes annealing and pickling, or sandblasting.

### ELECTRODES

*Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed*

| Diam. in in. | Length in in. | Cents Per lb. |
|---|---|---|
| | GRAPHITE | |
| 24 | 84 | 18.70 |
| 17, 18, 20 | 60, 72 | 18.70 |
| 8 to 16 | 48, 60, 72 | 18.70 |
| 7 | 48, 60 | 20.50 |
| 6 | 48, 60 | 21.95 |
| 4, 5 | 40 | 22.53 |
| 3 | 40 | 23.68 |
| 2½ | 24, 30 | 24.26 |
| 2 | 24, 30 | 26.57 |
| | CARBON | |
| 40 | 100, 110 | 8.45 |
| 35 | 65, 110 | 8.45 |
| 30 | 65, 84, 110 | 8.45 |
| 24 | 72 to 104 | 8.45 |
| 20 | 84, 90 | 8.45 |
| 17 | 60, 72 | 8.45 |
| 14 | 60, 72 | 9.02 |
| 10, 12 | 60 | 9.30 |
| 8 | 60 | 9.58 |

### FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective $CaF_2$ content:

70% or more ..... $43.00
60% or less ..... 40.00


OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

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***WL steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability—thus eliminating costly changes in heat treating specifications.***

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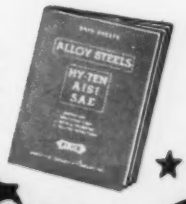


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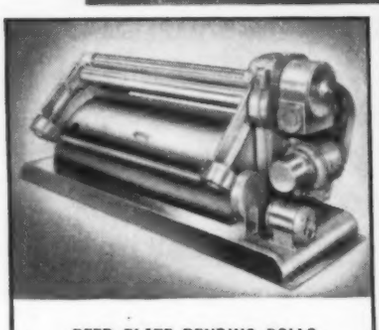

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- ★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x ¼" in capacity
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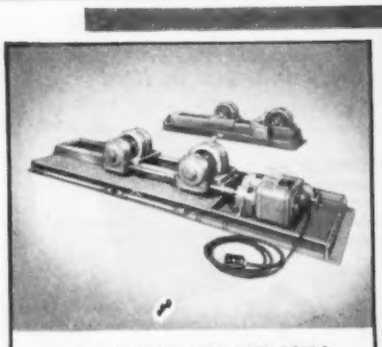

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1006 W. FAIRVIEW, CARTHAGE, MISSOURI

## —Miscellaneous Prices—

*(Effective Apr. 14, 1953)*

## BOLTS, NUTS, RIVETS, SCREWS

### Consumer Prices

*(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)*

**Nuts, Hot Pressed, Cold Punched—Sq.**

| | Pct Off List | | | |
|---|---|---|---|---|
| | Less Keg | K. Reg. | Less Keg | K. Hvy. |
| ½ in. & smaller. | 15 | 28½ | 15 | 28½ |
| 9/16 in. & ⅝ in. | 12 | 25 | 6½ | 21 |
| ¾ in. to 1½ in. inclusive ..... | 9 | 23 | 1 | 16½ |
| 1⅝ in. & larger. | 7½ | 22 | 1 | 16½ |

**Nuts, Hot Pressed—Hexagon**

| | | | | |
|---|---|---|---|---|
| ½ in. & smaller. | 26 | 37 | 22 | 34 |
| 9/16 in. & ⅝ in. | 16½ | 29½ | 6½ | 21 |
| ¾ in. to 1½ in. inclusive ..... | 12 | 25 | 2 | 17½ |
| 1⅝ in. & larger. | 8½ | 23 | 2 | 17½ |

**Nuts, Cold Punched—Hexagon**

| | | | | |
|---|---|---|---|---|
| ½ in. & smaller. | 26 | 37 | 22 | 34 |
| 9/16 in. & ⅝ in. | 23 | 35 | 17½ | 30½ |
| ¾ in. to 1½ in. inclusive ..... | 19½ | 31½ | 12 | 25 |
| 1⅝ in. & larger. | 8½ | 23 | 2 | 17½ |

**Nuts, Semi-Finished—Hexagon**

| | Reg. | | Hvy. | |
|---|---|---|---|---|
| ½ in. & smaller. | 35 | 45 | 28½ | 29½ |
| 9/16 in. & ⅝ in. | 23 | 35 | 17½ | 30½ |
| ¾ in. to 1½ in. inclusive ..... | 24 | 36 | 15 | 28½ |
| 1⅝ in. & larger. | 13 | 26 | 8½ | 23 |
| | Light | | | |
| 7/16 in. & smaller ..... | 35 | 45 | | |
| ½ in. thru ⅝ in. | 28½ | 39½ | | |
| ¾ in. to 1½ in. inclusive ..... | 26 | 37 | | |

**Stove Bolts** — *Pct Off List*

| | |
|---|---|
| Packaged, steel, plain finished | 48—10 |
| Packaged, plain finish ..... | 31—10 |
| Bulk, plain finish** ..... | 62* |

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Inc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

**Rivets**

| | |
|---|---|
| | *Base per* 100 lb |
| ½ in. & larger ..... | $8.50 |
| | *Pct Off List* |
| 7/16 in. and smaller ..... | 30 |

**Cap and Set Screws**

| *(In bulk)* | *Pct Off List* |
|---|---|
| Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright ..... | 54 |
| ¾ in. thru 1 in. up to & including 6 in. | 43 |
| ¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat ..... | 46 |
| ¾ in. thru 1 in. up to & including 6 in. | 41 |
| Milled studs ..... | 35 |
| Flat head cap screws, listed sizes.... | 16 |
| Fillister head cap, listed sizes..... | 34 |
| Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter | 53 |

**Machine and Carriage Bolts**

| | *Pct Off List* Less Case | C. |
|---|---|---|
| ½ in. & smaller x 6 in. & shorter ..... | 15 | 28½ |
| 9/16 in. & ⅝ in. x 6 in. & shorter ..... | 18½ | 30½ |
| ¾ in. & larger x 6 in. & shorter ..... | 17½ | 29½ |
| All diam. longer than 6 in... | 14 | 27½ |
| Lag, all diam. x 6 in. & shorter ..... | 23 | 35 |
| Lag, all diam. longer than 6 in. ..... | 21 | 33 |
| Plow bolts ..... | 34 | .. |

**the smith had the right id●a**

When it comes to forming metals, there's no substitute for the hammer. No other method gives metal equal toughness and resiliency.

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**THE TORRINGTON COMPANY**
*Swager Department*
555 Field Street • Torrington, Conn.
Makers of
TORRINGTON NEEDLE BEARINGS

## —Miscellaneous Prices—

*(Effective Apr. 14, 1953)*

### REFRACTORIES

| Fire Clay Brick | *Carloads, per* 1000 |
|---|---|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25) | $99.30 |
| No. 1 Ohio | 92.40 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 92.40 |
| No. 2 Ohio | 83.15 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60) | 14.40 |

| Silica Brick | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $99.30 |
| Childs, Pa. | 103.95 |
| Hays, Pa. | 105.10 |
| Chicago District | 122.40 |
| Western Utah | 116.55 |
| California | 122.85 |
| Super Duty, Hays, Pa., Athens, Tex., Chicago | 116.65 |
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 17.30 |
| Silica cement, net ton, bulk, Hays, Pa. | 19.60 |
| Silica cement, net ton, bulk, Ensley, Ala. | 18.45 |
| Silica cement, net ton, bulk, Chicago District | 18.45 |
| Silica cement, net ton, bulk, Utah and Calif. | 25.95 |

| Chrome Brick | *Per net ton* |
|---|---|
| Standard chemically bonded Balt., Chester | $86.00 |
| Burned, Balt., Chester | 80.00 |

| Magnesite Brick | |
|---|---|
| Standard Baltimore | $109.00 |
| Chemically bonded, Baltimore | 97.50 |

| Grain Magnesite | *St. ⅝-in. grains* |
|---|---|
| Domestic, f.o.b. Baltimore in bulk fines removed | $64.40 |
| Domestic, f.o.b. Chewalah, Wash., in bulk | 38.00 |
| in sacks | 43.70 |

**Dead Burned Dolomite**

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ .... $13.75

### LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.*

| | *Gross Ton* |
|---|---|
| Openhearth lump | $10.95 |
| Old range, bessemer | 10.10 |
| Old range, nonbessemer | 9.95 |
| Mesabi, bessemer | 9.85 |
| Mesabi, nonbessemer | 9.70 |
| High phosphorus | 9.70 |

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

### METAL POWDERS

*Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.*

| | |
|---|---|
| Swedish sponge iron c.i.f. New York, ocean bags | 10.9¢ |
| Canadian sponge iron, del'd. in East | 12.0¢ |
| Domestic sponge iron, 98+% Fe, carload lots | 15.5¢ to 17.0¢ |
| Electrolytic iron, annealed, 99.5+% Fe | 44.0¢ |
| Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe | 60.0¢ |
| Hydrogen reduced iron, minus 300 mesh, 98+% Fe | 53.0¢ to 80.0¢ |
| Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe | 83.0¢ to $1.48 |
| Aluminum | 21.5¢ |
| Brass, 10 ton lots | 30.00¢ to 33.25¢ |
| Copper, electrolytic | 10.75¢ plus metal value |
| Copper reduced | 10.00¢ plus metal value |
| Cadmium, 100-199 lb. | 95¢ plus metal value |
| Chromium, electrolytic, 99% min., and quantity, del'd. | $3.50 |
| Lead | 7.5¢ to 12.0¢ plus metal value |
| Manganese | 57.0¢ |
| Molybdenum, 99% | $2.75 |
| Nickel, unannealed | 88.0¢ |
| Nickel, annealed | 95.0¢ |
| Nickel, spherical, unannealed | 92.0¢ |
| Silicon | 38.5¢ |
| Solder powder | 7.0¢ to 9.0¢ plus met. value |
| Stainless steel, 302 | 83.0¢ |
| Stainless steel, 316 | $1.10 |
| Tin | 14.04¢ plus metal value |
| Tungsten, 99% (65 mesh) | $6.00 |
| Zinc, 10 ton lots | 23.0¢ to 30.5¢ |


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Here at last! 4X to 3000X continuous magnification on the photographic plate . . . bayonet mounted accessories which are automatically seated and centered to allow quick, thorough object inspection under all techniques. Both are offered in the remarkable "ZC" *Galileo* Universal Microscope. Magnification of any objective setup can be instantly increased or decreased 4 times without recentering. Specimens can be viewed through monocular or binocular eyepieces, recorded on the 5" x 7" camera and the cine extension—and in transmitted light also projected—all at the same time. A built-in exposure meter insures correct results on plates, film or polaroid.

The "ZC" *Galileo* is designed to perform research or routine work in every field of metallography with maximum speed, ease and comfort. Utilizing a vertical optical path, it stands just five feet high, makes seated operation easy and comfortable. In a single compact instrument, it provides everything needed for macro- and microphotography, polarization, phase, dark field, oblique and standard microscopy in transmitted and reflected light. It will also do multiple beam interferometry. Two independent light sources are provided, and a Zircon arc 100 W bulb with condenser system is available. Switching from transmitted to reflected light is instantaneous, or both may be used together.

For the full story on the "ZC" and other optical instruments of modern design by *Galileo*, write to the address below, Dept. A.

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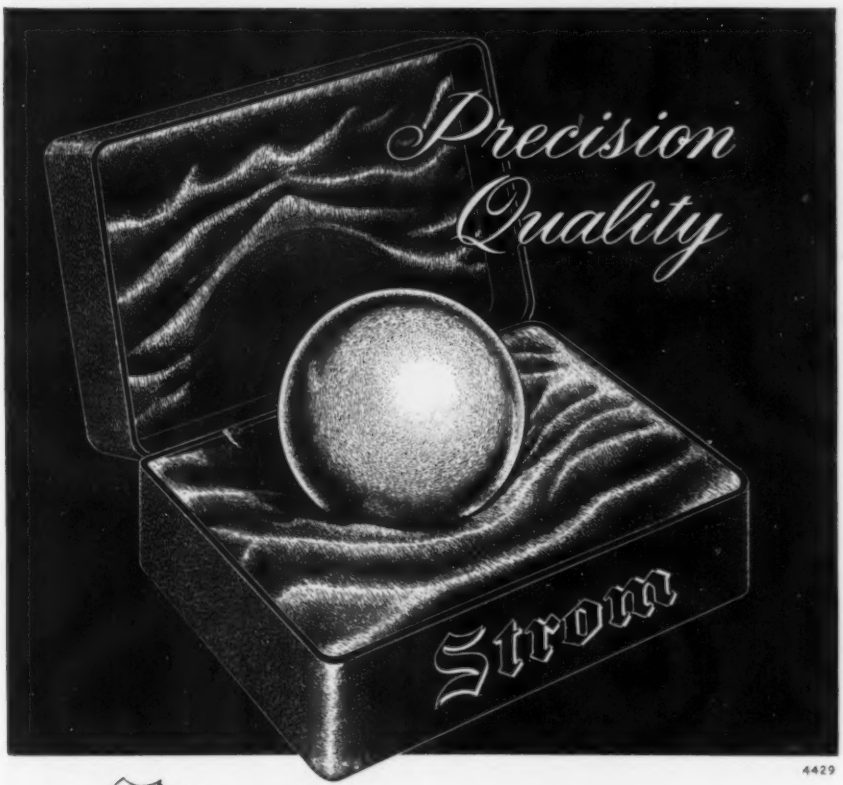


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*Largest Independent and Exclusive Metal Ball Manufacturer*
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Carbon Tool Steels.

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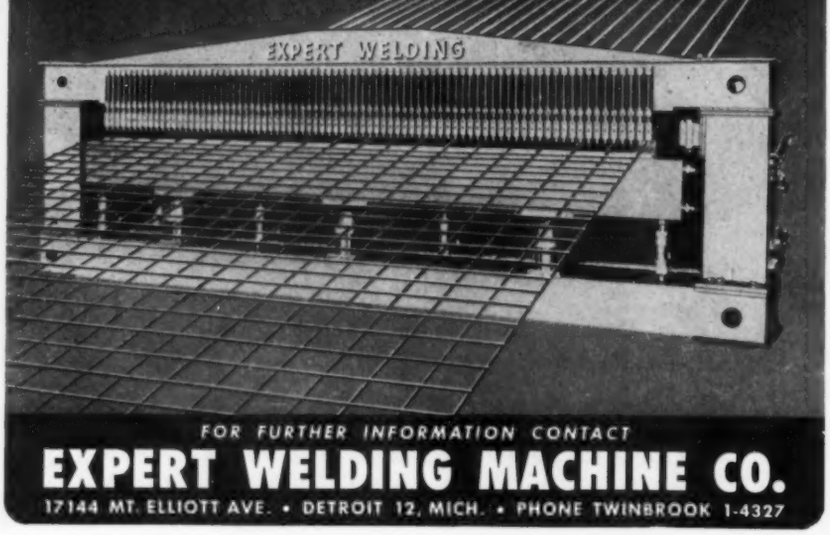
for EVERY PURPOSE




FOR FURTHER INFORMATION CONTACT

**EXPERT WELDING MACHINE CO.**

17144 MT. ELLIOTT AVE. • DETROIT 12, MICH. • PHONE TWINBROOK 1-4327

## —Ferroalloy Prices—

*(Effective Apr. 14, 1958)*

### Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

| | | | |
|---|---|---|---|
| 0.06% C | 34.50 | 0.20% C | 33.50 |
| 0.10% C | 34.00 | 0.50% C | 33.25 |
| 0.15% C | 33.75 | 1.00% C | 33.00 |
| 2.00% C | | | 32.75 |
| 65.69% Cr, 4-9% C | | | 24.75 |
| 62-66% Cr, 4-6% C, 6-9% Si | | | 25.00 |

### S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

| | |
|---|---|
| Carloads | 25.85 |
| Ton lots | 28.00 |
| Less ton lots | 29.50 |

### High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochome price schedule. Add 3¢ for each additional 0.25% of N.

### Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

| | |
|---|---|
| 0.10% max. C | $1.13 |
| 0.50% max. C | 1.14 |
| 9 to 11% C | 1.11 |

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

### Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe

| | |
|---|---|
| Carloads | 19.00 |
| Ton lots | 22.10 |
| Less ton lots | 23.60 |

### Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

| | |
|---|---|
| Carloads | 20.00 |
| Ton lots | 22.30 |
| Less ton lots | 23.30 |

### CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

| | |
|---|---|
| Ton lots | 20.75 |
| Less ton lots | 22.00 |

### SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

| | |
|---|---|
| Ton lots | 17.50 |
| Less ton lots | 19.50 |

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

| | |
|---|---|
| Ton lots | 16.50 |
| Less ton lots | 17.75 |

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

| | |
|---|---|
| Carload packed | 18.00 |
| Ton lots to carload packed | 19.00 |
| Less ton lots | 20.50 |

### Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

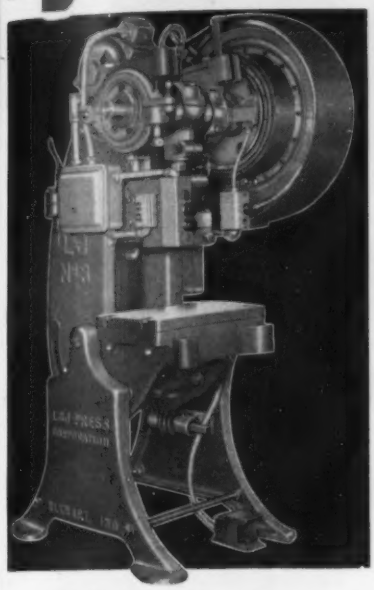
| | |
|---|---|
| F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O. | $225 |
| | 227 |
| F.o.b. Johnstown, Pa. | 225 |
| F.o.b. Sheridan, Pa. | 224 |
| F.o.b. Etna, Clairton, Pa. | 225 |
| F.o.b. Philo, Ohio | 225 |

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

| | |
|---|---|
| Carload, bulk | 12.45 |
| Ton lots, packed | 14.05 |

# L&J PRESSES



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L & J Presses are made in 12 O.B.I. models—back geared and plain flywheel types—and 8 sizes from 6 to 80 ton capacities.

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### SPECIFICATIONS

**No. 3 Plain Flywheel Press with L & J—Fawick Air Clutch**
**(Illustrated)**

Includes single stroke inching and continuous running. Also variable speed and automatic lubrication. 22 ton capacity, 2½" standard stroke, 8¼" or 10¼" die space (bed to slide, stroke down, adjustment up), 21¼" x 12¾" bolster plate area L. to R. x F. to B., 6¾" throat depth, 10" opening through back, 2,250 pounds net weight.

L&J PRESS CORPORATION
1623 STERLING AVENUE
ELKHART, INDIANA


## —Ferroalloy Prices—

*(Effective Apr. 14, 1953)*

**Spiegeleisen**

Contract prices gross ton; lump, f.o.b.

| | 16-19% Mn 3% max. Si | 19-21% Mn 3% max. Si |
|---|---|---|
| Palmerton, Pa. | $84.00 | $85.00 |
| Pgh. or Chicago | 84.00 | 85.00 |

**Manganese Metal**

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed ..... 36.95
Ton lots ..... 38.45

**Electrolytic Manganese**

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads ..... 30.00
Ton lots ..... 32.00
Less ton lots ..... 34.00 to 37.00
Premium for hydrogen-removed metal ..... 1.50

**Low-Carb Ferromanganese**

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% P, 90% Mn ..... | 28.45 | 30.30 | 31.50 |
| 0.07% max. C ..... | 27.95 | 29.80 | 31.00 |
| 0.15% max. C ..... | 27.45 | 29.30 | 30.50 |
| 0.30% max. C ..... | 26.95 | 28.80 | 30.00 |
| 0.50% max. C ..... | 26.45 | 28.30 | 29.50 |
| 0.75% max. C, 80-85% Mn, 5.0-7.0% Si ... | 23.45 | 25.30 | 26.50 |

**Medium Carbon Ferromanganese**

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

**Silicomanganese**

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.
Carload bulk ..... 11.40
Ton lots ..... 13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet ..... 12.65
Ton lots, packed ..... 14.25

**Silvery Iron (electric furnace)**

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

**Silicon Metal**

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe ..... 18.00
97% Si, 1% Fe ..... 18.50

**Silicon Briquets**

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.
Carloads, bulk ..... 6.95
Ton lots ..... 8.55

**Electric Ferrosilicon**

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

| | | | |
|---|---|---|---|
| 25% Si .... | 20.00 | 75% Si .... | 14.30 |
| 50% Si .... | 12.40 | 85% Si .... | 15.55 |
| 90.95% Si ..... | | | 17.00 |

**Calcium Metal**

Eastern zone contract prices, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots ..... | $2.05 | $2.95 | $3.75 |
| Less ton lots.. | 2.40 | 3.30 | 4.55 |

**Ferrovanadium**

35-55% contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible ..... 3.10- 3.20
High speed steel (Primos).. 3.20- 3.25


THIS SAVING HAS BEEN OVER $1,000 A MONTH

1

STEEL GEAR PLATES LOOK LIKE MIRRORS

2

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Every day 200 Oakite Technical Service Representatives use Oakite cleaning materials and methods to help thousands of Oakite customers accomplish metal-cleaning jobs that are important parts of big production operations.

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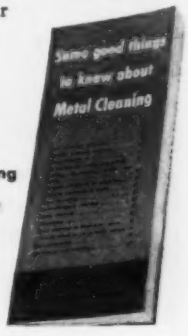
- Paint stripping
- Rust prevention

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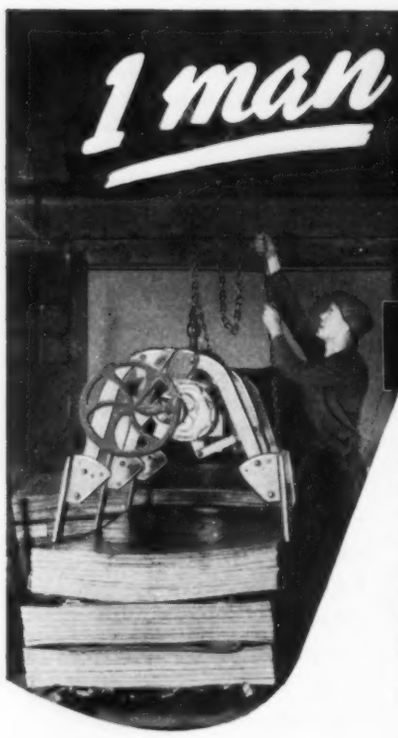

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C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method — and at lower cost per ton. Wide carrying angles hold sheets securely — won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.

*Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.*

CULLEN-FRIESTEDT CO.
1303 SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS


## —Ferroalloy Prices—

*(Effective Apr. 14, 1953)*

**Alsifer,** 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carloads ..... 9.90
Ton lots ..... 11.30

**Calcium molybdate,** 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ..... $1.15

**Ferrocolumbium,** 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
Ton lots ..... $4.50
Less ton lots ..... 4.95

**Ferro-Tantalum-Columbium,** 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta ..... $3.75

**Ferromolybdenum,** 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. ..... $1.32

**Ferrophosphorus,** electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton ..... $65.00
10 tons to less carload ..... $75.00

**Ferrotitanium,** 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

**Ferrotitanium,** 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots ..... 1.55

**Ferrotitanium,** 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ..... $177.00

**Ferrotungsten,** ¼ x down, packed, per pound contained W, ton lots, f.o.b. ..... $4.95

**Molybdic oxide,** briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... $1.13

**Simanal,** 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

**Vanadium Pentoxide,** 86 - 89% $V_2O_5$ contract basis, per pound contained $V_2O_5$ ..... $1.28

**Zirconium,** 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

**Zirconium,** 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

### Boron Agents

**Borosil,** contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

**Bortam,** f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound.... 50¢

**Corbortam,** Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

**Ferroboron,** 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 10% B ..... 1.20
19% min. B ..... 1.50

**Grainal,** f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 65¢
No. 79 ..... 50¢

**Manganese - Boron,** 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots ..... $1.40
Less ton lots ..... 1.57

**Nickel - Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
Less ton lots ..... $1.30

**Silenz,** contract basis, delivered.
Ton lots ..... 45.00¢

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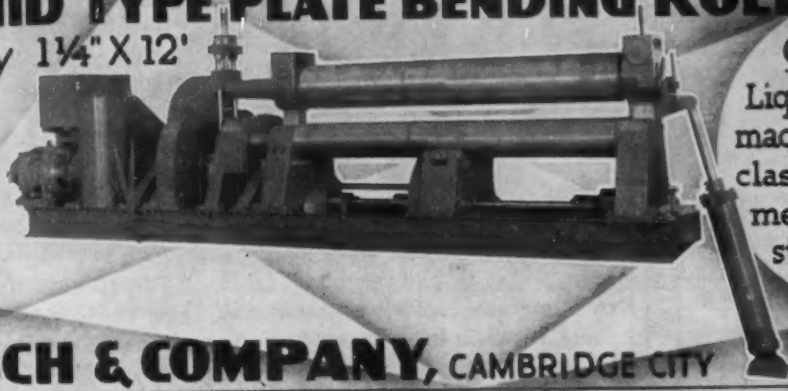
Capacity 1¼" X 12'



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**LOCK NUTS**
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—speed up assembly
—save space, weight
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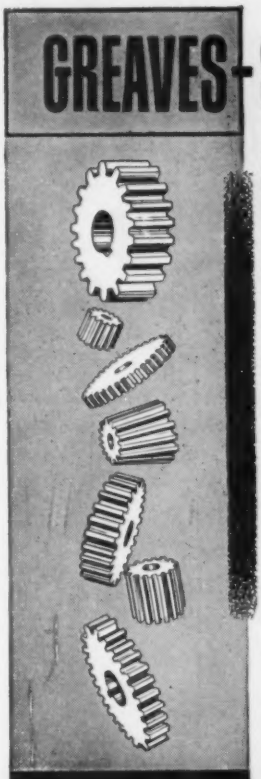

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18" x 54" centers MONARCH Lathe, motor in base, taper attachment, chucks

24" x 84" centers BOYE & EMMES Heavy Duty Geared Head Engine Lathe, chuck, AC-MD

**25/32" x 96" centers AMERICAN Pacemaker Heavy Duty Engine Lathe, taper attachment, chucks, 25HP AC motor, 1948**

25"/40" x 8' centers MONARCH Model "N" Lathe, new 1935

28" x 15' centers BERTRAM (Niles Patterns) Timesaver Engine Lathe, 2 carriages, rapid traverse, AC-MD, 1943

60" x 20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse

No. 3A WARNER & SWASEY Turret Lathe, 6¼" hole in spindle, bar feed, chuck, tooling, new 1942

No. 3L GISHOLT Turret Lathe, 5 1/16" hole thru spindle, 1943

**42" BULLARD Spiral Drive Vertical turret Lathe, Serial 23800, New 1944**

No. 3-24 CINCINNATI Plain Hydromatic Mill, AC-MD

No. 4 KEARNEY & TRECKER Plain Horizontal Mill, No. 50 taper, motor in base, rapid traverse

No. 4 CINCINNATI High Power Vertical Mill, No. 50 taper, power rapid traverse, AC motor

No. 4H KEARNEY & TRECKER Vertical Mill, new 1944

No. 12 BROWN & SHARPE Plain Automatic Production Mill, AC-MD, late type

25A HEALD Rotary Surface Grinder, 24" diameter magnetic chuck, AC-MD

48" x 48" x 16' LIBERTY Planer, variable voltage drive, new 1942

36" OHIO Dreadnaught Shaper, AC-MD

1½" LANDIS Bolt Threader, lead screws, AC-MD

75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & scrap cutter

No. 6G SELLERS Drill Grinder, new 1941

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# The Clearing House

**NEWS OF USED AND REBUILT MACHINERY**

**Had New Tools . . .** About a month ago, a man visited one of the eastern cities and made it known that he had the sales rights to numerous factory-new machine tools located in a bonded warehouse.

He showed several papers listing an inventory of the tools. Most of them were highly desirable units, including boring mills, production millers, lathes, horizontal mills and other equipment.

**Wanted to Sell . . .** The machines, he said, were in the custody of a bank and were in liquidation for a firm whose owners had died. His problem was to find the most profitable means of selling the equipment.

He said he had contacted several machinery manufacturers, but none of them were interested in buying back the equipment. An auction was out of the question, he said, because he did not believe he would realize the $500,000 he thought the tools were worth if they were offered at a public sale.

**Dealers Gypped Him . . .** Efforts to sell the tools to machinery dealers had not worked out, he reported, because they had tried to gyp him by offering much less than what he thought the tools were worth. He was looking for a reputable machinery dealer who would be willing to sell the tools on a commission basis, which he believed would net the dealer around $100,000.

The man also expressed great interest in adhering to government regulations concerning sales of machine tools.

Nothing more was heard on the matter until a dealer reported to Randy Vinson, executive director of the Machinery Dealers National Assn., that his firm had been the victim of a "confidence game." His letter was reprinted with the name withheld in a recent *What's Happening* report.

**How It Worked . . .** The dealer stated that the man contacted him and presented his case. Proposal agreed upon was that the machines were to be shipped from the bonded warehouse, in which they could not be opened for inspection, to the machinery dealer's warehouse where they would be put on display and sold.

However, before the tools could be shipped, funds were needed to pay 2 months' back rent on the warehouse and to cover shipping and handling charges. The dealer was to put up 50 pct of the money required.

**Dealer Paid . . .** An agreement was signed, and the dealer paid the man his share of the expenses. From that time on, the dealer has not been able to locate his "partner." He checked out of his hotel and left no trace as to his whereabouts.

Both the District Attorney and the F. B. I. have been informed about what happened and are currently working on this unfortunate case.

**Couldn't Investigate . . .** Though the dealer did make some attempt to check the validity of the man's story, the arrangements had to be made in such a hurry that he was unable to investigate as thoroughly as he would have under more normal circumstances.

Because the proposal was so very attractive, and due to the man's insistence that the arrangements be made hurriedly, the dealer's haste in entering into the agreement is understandable. His experience is a warning to other dealers who may find themselves in a similar position.

**Want Another Chapter . . .** Board of directors of the MDNA is meeting in Buffalo, Apr. 22, and will invite several non-member used machinery dealers in the area to attend a dinner in the hope of setting up another MDNA chapter.